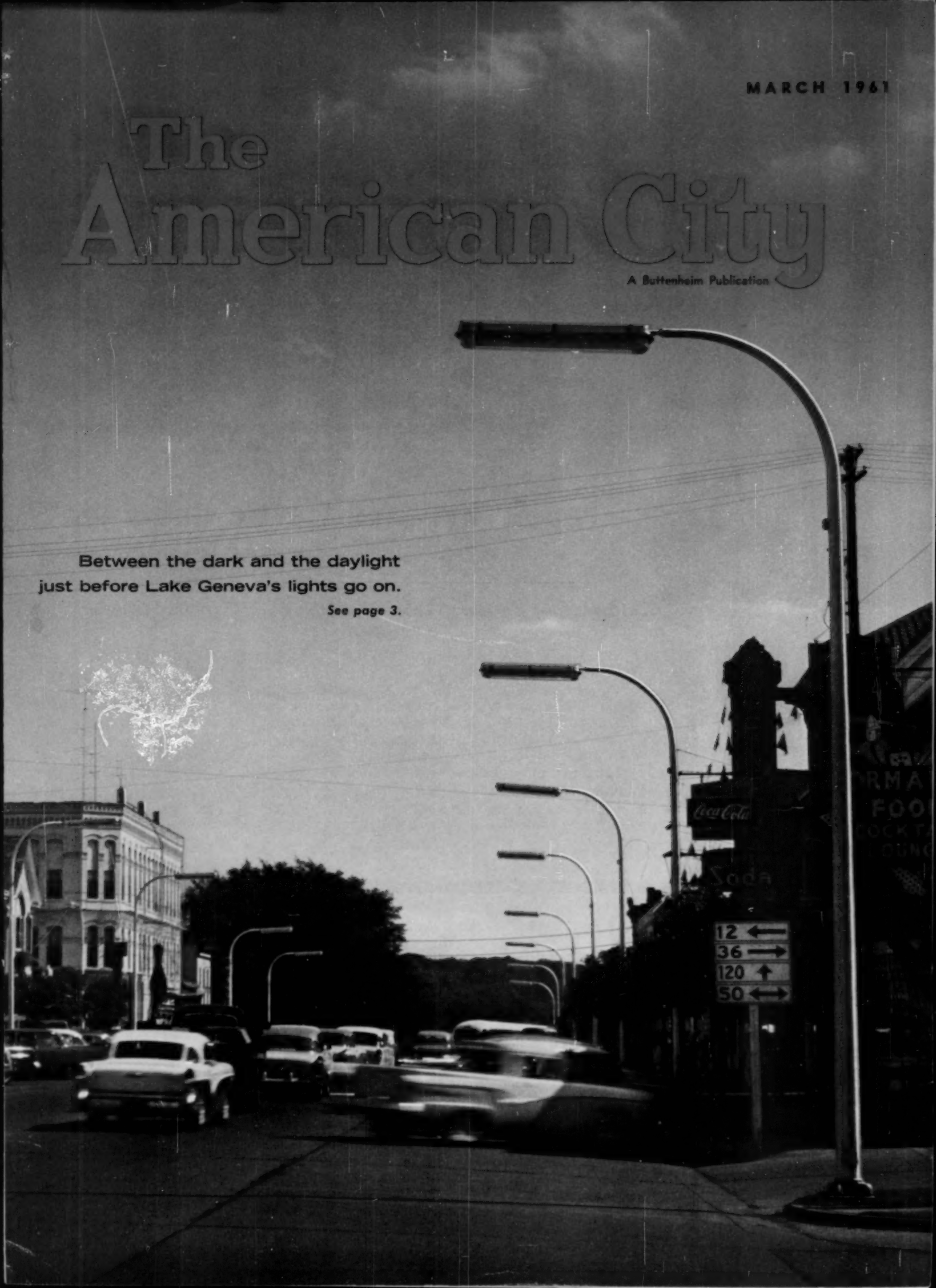
MARCH 1961

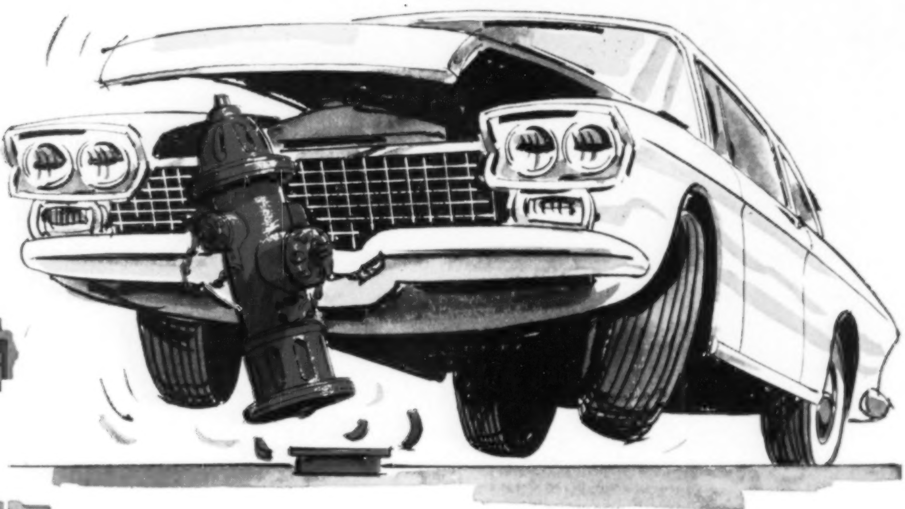
The American City

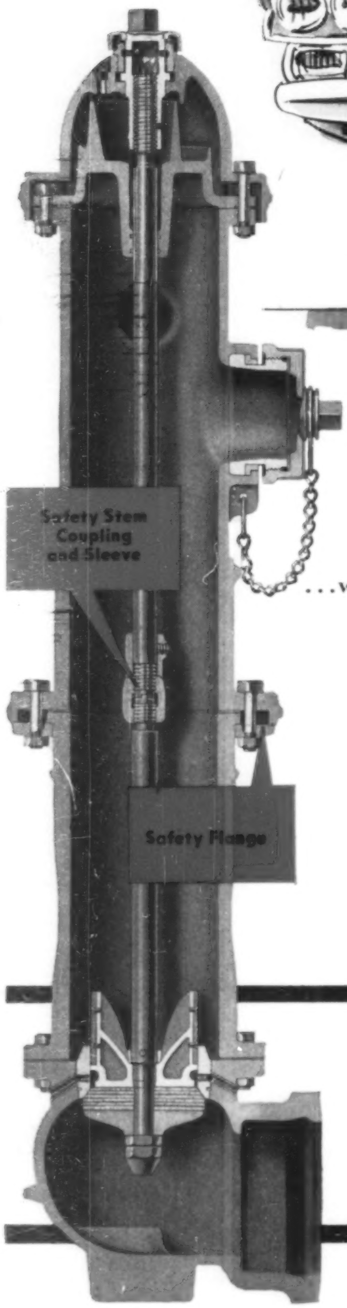
A Buttenheim Publication



Between the dark and the daylight
just before Lake Geneva's lights go on.
See page 3.

Coca-Cola
Soda
12 ←
36 →
120 ↑
50 ↔




Safety Stem Coupling and Sleeve
Safety Flange

repair hydrant traffic damage FAST

...without loss of water...without water shut-off...without digging

The Mueller AWWA Improved Fire Hydrant is quickly put back into action when knocked over.

Mueller's Safety Flange design prevents breakage of the hydrant barrel and bent or broken operating stem. Hydrant safety mechanism snaps off cleanly just above the ground line.

The compression-type main valve stays closed. No water is lost to affect pressure at neighboring hydrants. No damage is caused by flowing water. Lower stem section is held solidly in place to permit easy repair without digging.

The simple, inexpensive repair kit shown below contains all parts needed to completely restore hydrant to service in a matter of minutes.

Safety Flange Repair Kit

Consists of safety flange, safety stem coupling, safety flange gasket and can of Mueller hydrant lubricating oil.

Write for complete information and specifications.

MUELLER CO. Since 1857 SERVING the Water and Gas Industries QUALITY

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The
American City
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MARCH 1961

MAGAZINE OF MUNICIPAL MANAGEMENT AND ENGINEERING

ADMINISTRATION AND GOVERNMENT

Our municipal notebook 9
Municipal public relations 139

FINANCE AND TAXATION
BUSINESS MACHINES AND SYSTEMS

Cost accounting 91

STREET CONSTRUCTION AND MAINTENANCE
STREET CLEANING

Power mower cleans expansion joints 10
Slurry-seal cost data 10
Quicker service—cleaner streets 36
Asbestos asphalt in Atlanta 93
Good streets for little money 113
Madison plans its street types 166

OUTDOOR LIGHTING

Some of the best in street lighting 127
Lake Geneva's lighting 131
Heads NEMA's street-lighting section 131
Faithful to mercury 131
Creative lighting of Miami Beach mall 135

SEWERAGE AND SEWAGE PURIFICATION

Hurricane antidote 25
Enlarged sewage-purification policy 25
Pennsylvania leads in sewerage contracts 25
Sewage lagoon with a difference 88
More digestion capacity but no new digesters 106

TRAFFIC CONTROL

Tight parking enforcement 96
Newport Beach's parking policy 119
Pittsburgh reports on plastic markings 122
It counts vehicles and regulates lights 125
Traffic needs dictated in the field 125
Youngstown doubles its striping ability 125

REFUSE COLLECTION AND DISPOSAL

A big machine for a big job 29
Annexation requires refuse changes 29
Tighter controls on refuse burning 29
The sanitary fill—how it operates—Part II 98
Private refuse collection does work 153

PLANNING, ZONING, AND HOUSING

City-county planning 115
Madison plans its street types 166
Capital improvements in new subdivisions 183

PUBLIC SAFETY

Yazoo City learned fire safety 35
Phoenix fire alarm improved 35
Police-fire integration 179

WATER SUPPLY AND TREATMENT

New officers for AWWA 32
Official emblem for certified operators 32
Universal metering 85
More water plant in half the space 149
Second longest prestressed span 159
Clear water under all conditions 169
Golden, Colo., solves its problem 173

AIR POLLUTION

Air pollution control news 39

PURCHASING

Here's some help in buying uniforms 145
Purchasing news 211

PARKS AND PLAYGROUNDS

Miami gets surplus plane for kiddie park 27
Park purchase on the installment plan 27
A city-school park program 112

POWER

Boomer Lake power dividends 109

AIRPORTS AND AVIATION

An area-service airport 95

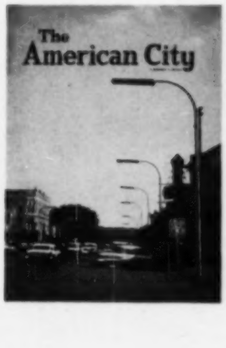
MISCELLANEOUS

20-year watershed program 104

DEPARTMENTS

Letters to the editor 5
Free catalogs 44
Zoning and planning decisions 186
Legal notes 189
City managers 191
Conventions: when and where 195
Municipal and civic publications 202
Municipal bond market 209
About people 236
Professional service directory 239

(For index to advertisers, see page 251)



Cover Picture

It seems to us that there's dignity and power in the fine appearance of this installation at Lake Geneva, Wis. The Line Material fluorescents are way up there, 30 feet above the pavement, on Pfaff & Kendall aluminum standards. City Manager Van Ness defines the system on page 131.

How many times did your citizens need outdoor phones today?

The Shopper

The Newcomer

The Forgetful

(And how much revenue did your city lose?)

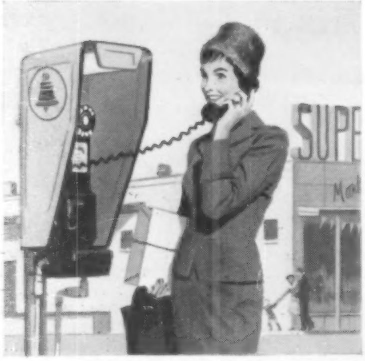
You're away from your office or home and you need to make a phone call. Even if it's during business hours, you lose time looking for a building with a phone booth. And if it's at night, your search may take several minutes and several blocks.

Sound familiar? It happens to many of your citizens every minute of every day.

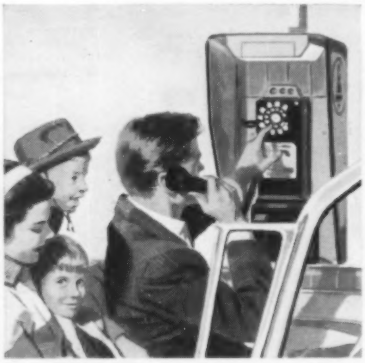
But there is an easy solution. Have a planned network of new outdoor telephones installed on your public property. Outdoor telephones not only give 24-hour service and protection, they also add extra revenue to your city's treasury—without adding a cent to your municipal tax burden.

Learn more about how your city can benefit from convenient, profitable outdoor telephones. Call your local Bell Telephone manager today. He'll happily arrange for a prompt, custom-designed telephone plan for your city.

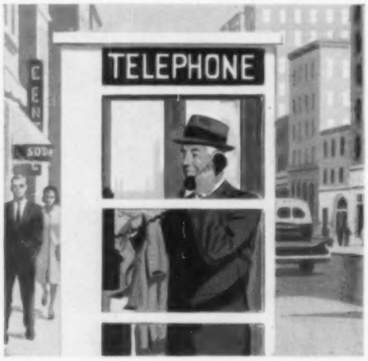
BELL TELEPHONE SYSTEM



The Walk-up Phone is especially handy for shoppers and other busy pedestrians in your city.



The Drive-up Phone welcomes travelers to your city. Lets them call without leaving their car.



The Airlight Booth gives your citizens telephone convenience and protection from the weather 24 hours a day.

Volume 76 Number 3

The
American City

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CONTRACTORS and ENGINEERS
OVERVIEW
Municipal Index
MART
AMERICAN SCHOOL AND UNIVERSITY

LETTERS TO THE EDITOR

Council-Management Myths

May I commend you on the editorial appearing in THE AMERICAN CITY for January entitled, "Council-Management Myths."

Having served as a city manager in six cities in four states, I can certainly speak from experience, if not with authority, about the first item which you discussed.

During my 33 years as a city manager I have served with 16 mayors. I can categorically state that none of these mayors under whom I served was a "rubber stamp" in any sense of the word. As a matter of fact, although none attempted to interfere in the administration of the city, they often differed strongly with policies recommended by the manager to the council.

Though this opposition was, with minor exceptions, on the broad general plane of policy and not personalities, I can also state categorically that some of the strongest opposition came from mayors who were personally most friendly and co-operative.

To be a bit more specific, in the City of Cincinnati, there have been four mayors since I became city manager. One is now a judge; one is a leader in the religious and civic life of the nation; one is now in Congress; and one, an individual of substantial means and high standing in the community, approaches problems from the point of view of the entire community.

Anyone who would examine the official record and the personal character and disposition of these four individuals would, of necessity, come to the conclusion that they were not and are not "ceremonial figureheads."

With regard to the second point raised in your editorial, that the council-manager plan can be effective in the central city of a metropolitan area, my experience verifies your point. I have been city manager in three cities, Norfolk, San Antonio, and Cincinnati, which are the core of large and growing metropolitan areas.

If there has been any difficulty in these areas it has not been due to the city government *per se* but to the fact that the people themselves and, in many instances, some officials of both the central city and the smaller communities were unwilling to consider in depth any type of metropolitan organization.

Until the temper of everyone in these metropolitan areas, both citizen and public official changes, the areas, including the central city, are in for some "tough sledding."

C. A. HARRELL
City Manager
Cincinnati, Ohio

EDITOR'S NOTE: Cincinnati has the distinction of being named by *Fortune* as the best administered large city in the nation. Mr. Harrell, its city manager, progressively advanced to this position through prior service as city manager in Portsmouth, Ohio; Binghamton, N. Y.; Schenectady, N. Y.; Norfolk, Va.; and San Antonio, Tex. He has an honorary LL.D. degree from Randolph-Macon College, where he received his undergraduate training. He has graduate degrees from Columbia University, the University of Cincinnati, and the Maxwell School of Citizenship, Syracuse University. He was the president of the International City Managers' Association in 1947.

Water Rates

We have received a great deal of help from the volume "Modern Water Rates" (published by THE AMERICAN CITY), containing representative samples of water-rate schedules used in other cities in the country.

I am planning to recommend to the Trustees that we make an adjustment of our rates based on the charges that are being levied by other cities that you have investigated.

THOMAS A. BANFIELD
Village Manager
Horseheads, N. Y.

Real Christmas Gifts

Your editorial in the December 1960 issue ("Real Christmas Gifts") was too appropriate to limit to the municipal family, so I took the liberty of forwarding it to the editor of our local paper who printed it for his readers here.

W. H. LANGE
City Administrator
Grosse Pointe Woods, Mich.

Warns Against Rear Step For Refuse Trucks

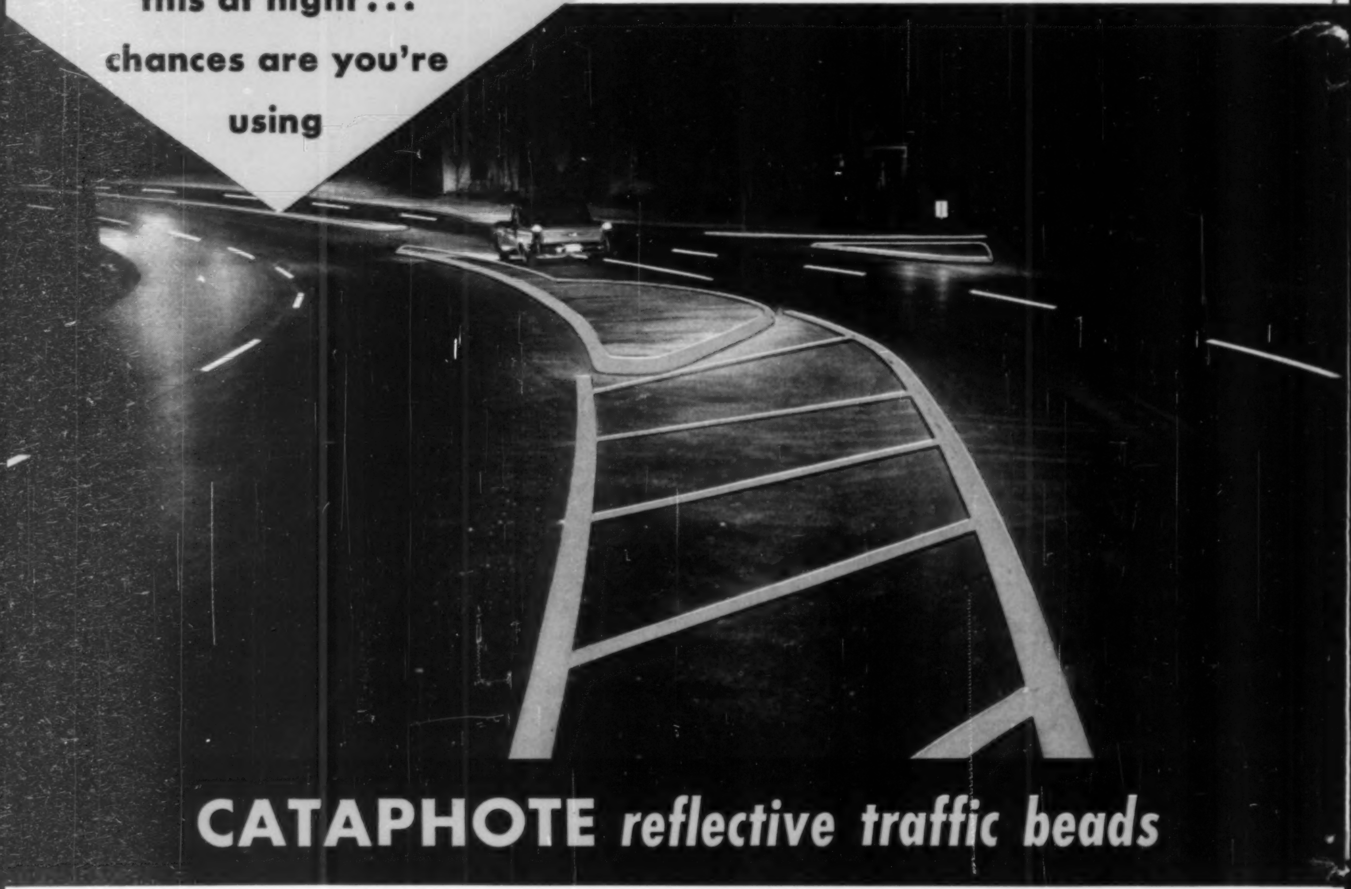
I noted with interest your article, "Safety for Municipal Employees" (THE AMERICAN CITY, November 1960, p. 30), recommending an expanded-metal platform for personnel at the rear of refuse trucks.

We have had similar experience

(Continued on page 18)

If your pavement markings look like this during the day . . .

and still look like this at night . . . chances are you're using



CATAPHOTE ***reflective traffic beads***

Clean bright stripes in daylight . . . brilliance that fairly leaps from the darkness at night . . . here are pavement markings that work full-time. In fair weather or foul . . . you can depend on life-saving protection when you reflectorize with Cataphote Waterproof Reflective Traffic Beads.

Cataphote Beads are easy to use. They may be premixed in traffic paint and applied with any conventional striping equipment. For immediate reflectance, use Cataphote Drop-on Beads in any standard bead dispenser. Regardless of method, you'll be rewarded with increased safety, faster paint drying time and 50% longer "stripe life."

Men who set the trends in traffic control have used Cataphote Reflective Beads for years. Catalog B-160 can help you be a leader, too. Send for it, today.

CATAPHOTE CORPORATION

TOLEDO 10, OHIO   JACKSON, MISSISSIPPI

MANUFACTURERS OF REFLECTIVE TRAFFIC PRODUCTS

EDITORIAL

More Metro Headaches

The gallant effort of Miami's metropolitan area to produce an organized metropolitan-type government ran into difficulties last month when County Manager O. W. (Hump) Campbell resigned under the traditional and colorful conditions of "fire."

While this does not mean the end of the only organized effort at metropolitan government in the United States in recent years, it does reinforce the statement that "Metros" are easier said than done. The action here was particularly interesting since the voters had just rejected proposals to weaken the Metro system.

This wasn't the only setback. In Durham, N. C., voters in the city and county defeated a proposed charter providing unification of city and county governments. The vote was an overwhelming 3½:1. Only one of the 36 precincts in the city and county voted favorably.

The proposed charter represented the results of a $10,000 study by the University of North Carolina's Institute of Government. Supporters included Durham's Mayor E. J. Evans, several city councilmen, and civic leaders in both the city and county. Opponents included various county officials.

Nevertheless, Metro proposals keep plugging along. The most recent is the legislation proposed by California's Governor Edmund G. Brown. He wants legislation permitting nine "federated" urban governments. Significant in his proposal is that the governing board of such a district would be a council comprising both city and county officials.

Such a "federated" district would be empowered to tax, issue bonds, make long-range plans for water, sewerage, law enforcement, regional parks and civil defense. The nine areas embraced by the legislation include Bakersfield, Fresno, Los Angeles, Modesto, Sacramento, San Diego, San Francisco, Santa Barbara, and Stockton.

Next Year's Snow-Removal Program

In time of peace, we have been told for years, prepare for war—useful in those simple days when the consequences of war were not so totally devastating.

But to paraphrase, in the warmth of spring, prepare for next winter's snow. March is the time to make those preparations. If your snowfall during December, January and February has been heavy enough to create problems, now is the time to get corrective measures that the public will be reluctant to give you later.

Take snow tires or chains for example. In this automotive age, we regulate auto speed, require directional signals, automatic windshield wipers, various warning lights. We insist on motor inspections and checkups, we have a right—even an obligation—to specify that cars operating in snow have the tire traction for it.

A city has every right to place a heavy penalty on any car stalled by snow on key arterial routes if it does not have either snow tires or chains. Today, in the month of March, the public realizes how foolhardy and often hopeless it is to drive in heavy snows without them. In another couple of months it will have forgotten.

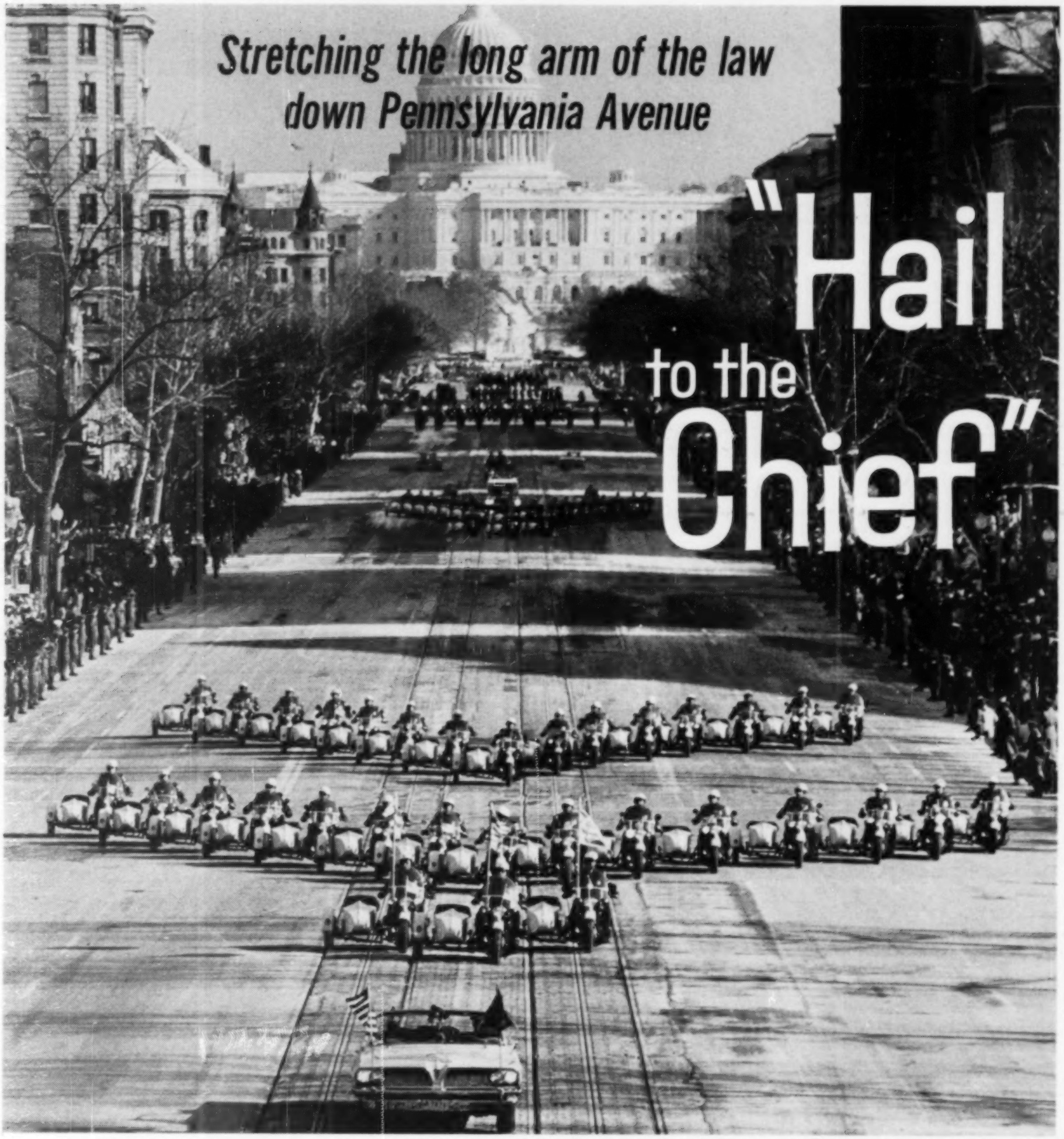
Consider also barring unnecessary auto traffic as a heavy snow approaches and adopting a warning system that will send people home before trouble starts. Some cities on the Eastern seaboard barred unnecessary auto traffic *after* snow had fallen. If they had established the machinery to bar this traffic *before* the big snows, they would have simplified their snow-removal work and saved many motorists a good deal of expensive inconvenience.

Last January, we sat by our television sets and saw President Kennedy take office during a heavy snowstorm. Four days later, more than 1,000 autos still remained abandoned in the Washington, D. C., streets, blocking snow plows, hampering fire-fighting work, and creating general paralysis in the area. Inauguration or no, this is incompatible with a well organized urban society.

If you have had heavy snows during December, January, or February, the public still remembers them in March. Most will agree that in these days of rapidly-expanding urban areas the day of casual motoring in the face of severe snow storm forecasts must end.

Of course, if you haven't had these snows, the selling job may be tougher. City Engineer Arthur Grimm, in Des Moines, probably would have this trouble. He tells us happily that the best snow-removal program is no snow, bright sun and high temperatures, such as his city has enjoyed during much of this past winter. City Engineer Leonard Swanson, Rapid City, S. Dak., also might find opposition. He reports that his city is in the "banana belt" and it is a pity that the rest of the country doesn't realize it.

Nevertheless, if you want measures that will have the public working with you, instead of against, next winter, March is the best month to propose them.



Squadrons of Harley-Davidson motorcycles spearhead President's inaugural parade

An escort fit for a president! Certainly a proud and historic duty for the police officers who had the honor of leading President John F. Kennedy in the colorful inaugural parade in our nation's capital.

Harley-Davidson police motorcycles made up the crack formations that thrilled the throngs lining Pennsylvania Avenue, waiting to welcome their new president. Nearly 100 Harley-Davidson Solos participated in the inaugural parade, many of them bright new 1961 models.

Whether it's escorting very important people, apprehending criminals or traffic control, Harley-Davidson police motorcycles are the immediate choice of police departments throughout the country. Their outstanding maneuverability, versatility and reliable performance are a few of the reasons. Harley-Davidson Motor Co., Milwaukee 1, Wisconsin.

HARLEY-DAVIDSON *Police Motorcycles*

OUR MUNICIPAL NOTEBOOK

A VACUUM-CLEANED INCINERATOR

. . . like a vacuum-cleaned rug means that you do a messy job in a handy way. The incinerator operated by the Southeastern Oakland County Incinerator and Rubbish Authority has a vacuum cleaner that not only helps keep the building clean but also assists in removing fly ash from the combustion chambers.

Superintendent Marx Fall uses a six-man clean-up crew to clean the combustion chambers every Monday morning. This takes about two hours.

The men then use the vacuum to pick up the remaining fly ash in the cracks of the brick floor. The cleaner is a U. S. Hoffman unit with a 30-hp exhauster, serving two flexible hoses. The plant is designed to burn 450 tons of refuse a day and receives refuse from a nine-city area.

* * *

30 CURB-MILES PER DAY

. . . is a good fat record for any street sweeper but it is par for the course in Westfield, N. J. This residential community of some 31,000 people has a Wayne Model 550 with a four-yard hopper and maintains one full-time and one part-time operator. The sweeper not only picks up street debris but hauls it to a central dumping point, thus eliminating rehandling. Town Engineer L. M. Collins interrupts his street-cleaning program only during times when he seal-coats the streets. In those periods, he used the street sweeper to pick up and reclaim excess stone chips.

* * *

LARGEST IN THE WORLD

. . . describes the trickling filters which are purifying sewage at El Paso, Texas. Superintendent Haskell R. Street has four of these, each 220 feet in diameter, operating in parallel.

The filters normally operate at a rate of about 12,000,000 gallons per acre per day and have been designed for a recirculation rate of about 1.7 times the normal flow. Some times this is supplied from the filter effluent and at the other times it is taken from the bottom of the final settling basin at the effluent end. The average removal of BOD in the plant is about 87% or about 2,280 pounds per acre foot of stone in the filters .

One distinctive feature of these filters is the peripheral shallow collecting flume. An operator can observe visually the flow as it emerges from each line of filter blocks and can rod an opening clear, if necessary. With this advantage, however, the operators cannot flood the filters to rid them of the annoying psychoda filter flies. Fortunately this plant is not bothered by flies.

* * *

HONESTY AT CITY HALL

. . . ought to receive more recognition than it does. At times, it is spectacular. Take the refuse-collection crews at El Paso, Tex. In one year, they returned a wallet to a man who had been foolishly carrying $600 in cash and $1,200 in endorsed checks; a lady's handbag containing $200 in endorsed checks; an expensive wristwatch to a housewife who lost it in a garbage pail; and nine sets of citizenship papers dropped in the gutter.

A new bride called, tearfully, reporting that she had thrown her $600 diamond ring into the refuse container by mistake. Through Sanitation Department records, an inspector identified the truck, spotted its location at the fill and, after a three-hour search, found and returned the ring.

At the same time, Superintendent Ed Muckelroy received a complaint from a housewife, claiming that a refuse crew had stolen a shirt, later found on a bedroom doorknob.

If you want more information on these topics, or any other municipal problems, drop a note to

The Editors
THE AMERICAN CITY
470 Park Avenue South
New York 16, New York

FROM GARBAGE TO GOLF

A golf course and other recreational facilities have come about as a result of the Houston, Tex., sanitary-fill program. Utilities Director J. M. Nagle has two IH TD-14, two IH TD-18A, four IH TD-24 crawler tractors, one Heil and one Allis-Chalmers Cable Scraper, and one Michigan Front End Loader that excavate a trench six feet deep, 50 feet long, and ten feet wide, and compact the refuse in it. The program reclaims about 14 acres of otherwise wasteland per year or a total of 270 acres to date.

* * *

MUNICIPAL FORESTS

. . . have a lot more popularity than most realize. One estimate places the number of them at 3,300. The largest is Seattle's 67,000-acre watershed and all have a potential income factor. Fredericksburg, Va., for example, has 110 acres in pine that will recover the entire cost of the land through the sale of pulpwood and saw timber. City Manager Freeman Funk reports that one cutting for pulpwood has yielded a $5,000 return.

MUNICIPAL PROPERTY

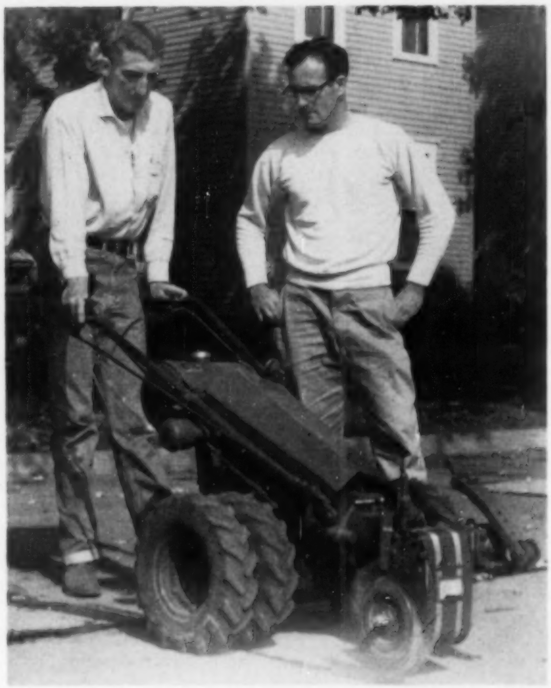
* * *

MECHANICALLY CLEANED

. . . catch basins are a municipal money-saver.

Philadelphia's Street Commissioner David M. Smallwood conducted a test to determine the economy of cleaning catch basins by machine, or by hand. The machines won by a score of $2.55 to $2.92 per catch basin. During a 10-day test period, a Stetco inlet unit cleaned 349 catch basins, removing an average of 216 pounds of muck from each. The machine has a three-man crew: the operator, a truckdriver and truck, and one laborer. The city now has 15 mechanical catch-basin cleaners. ◄◄

Power Mower Cleans Expansion Joints



Gerald Lloyd, Superintendent of Cemeteries (right), directs the joint-cleaning operation.

The Street Department of Zanesville, Ohio, needed a self-propelled machine to clean expansion joints in concrete pavements and cracks in asphalt pavements prior to sealing operations. For this work the city is now using one of its power mowers, resourcefully modified by a wire-brush attachment.

The basic part of the machine is a standard dual-tired Gravely tractor. Using the driving-arm attachment that operates reel-type mowing cutters, Gerald Lloyd, Superintendent of the city's Woodlawn Cemetery, put together a chain-driven axle in the enclosed housing to turn the 16-inch-diameter wire brush. The wire brush is a heavy-duty type used by foundries to clean castings. The brush can be raised or lowered manually to achieve any necessary depth in cleaning a pavement joint or crack.

Usually, compressed air cleans the pavement joints after brushing. However, the high-speed wire brush generally makes this unnecessary. Moreover, use of a smaller diameter wire brush on each side of the large brush completely eliminates the necessity for air cleaning.

When the wire brush will not dislodge foreign material in a joint, a steel gouge attachment will do the trick, using the pushing power of the tractor. The gouge is attached to the frame of the machine, to the right of the wire brush, by an arm made from three-inch-wide steel channel.

The brush attachment and gouge arm can be removed quickly from the mowing unit and rotary mowing attachment installed for regular mowing duties in the cemeteries and parks.

FRED E. HARDY
Director of Public Works
Zanesville, Ohio

Slurry-Seal Cost Data

Following successful slurry-seal programs in past years, we constructed a special truck unit in preparation for an expanded 1960 program. The unit contains tanks for Bitumuls and for water, and a large plaster mixer. Between May 6th and October 21st, a crew of four men, using this unit, placed slurry seals on 8,000,946 square feet of street surface.

Our aim is to place a new slurry seal on every street surface every three years. We follow an area pattern, placing the seal on all streets in a particular area. This includes freshly paved streets and a few cement-concrete streets. This program has improved street appearance and reduced maintenance costs in this city of 77,000 people, with 8 square miles of area and approximately 160 miles of streets.

The cost of the work amounted to $24,983.07 and can be broken down into $14,463.06 for labor, $1,047.20 for rental of equipment, and $9,472.81 for materials.

Cost and material used on a unit basis was as follows:

Item	Square Foot	Square Yard
Cost	$.00312	$.02808
Rock Dust	.21 pounds	1.89 pounds
Bitumuls DM-1h	.0063 gallons	.0567 gallons

The cost figures represent a 41% increase over actual payroll on all salaries, to cover overhead. The hourly rental of equipment is slightly lower than equipment rented commercially. We used 50,432 gallons of DM-1h for the program.

Modifications on the equipment may result in a crew reduction from four to three men for the 1961 program.

M. R. PEARCE
Director of Public Works
Inglewood, Calif.

Safer, Brighter, Easier to Service with Swivel Head and Double-Beam Warning

DIETZ

NEW Visi-Flash® Barricade Flashers

Offering the last word in a flasher optical system . . . one that concentrates more light on the danger or obstacle, re-inforcing the flashing light with a brilliant fringe of reflected light from the headlamps of oncoming traffic.

Flashers that are easier to service, that require less servicing per hour of use, and that will turn on and off as daylight fades or dawns.

No mechanical switches or other moving parts to consume current or cause trouble. Wide choice of low-drain transistorized circuits offer an extensive range of flash rates. Drain on batteries is so slight that even the two-cell No. 665 model will burn about 1500 hours, while the six-cell No. 675 will burn about 4500 hours.

DIETZ Visi-flash
TRANSISTORIZED WARNING LIGHT
DIETZ Visi-flash

No. 665

No. 675

10 IMPORTANT FEATURES

- **Big 7¼" lens, especially for flasher use**
- **Optional ½" reflector rim offers full 10 sq. in. of reflecting surface**
- **High-brightness neon lamp or standard filament**
- **Can be rotated 180° to cover any approach angle**
- **Choice of flash rates and candlepower**
- **Optional photocell to turn light on, off**
- **Diecast visor deflects snow, rain, sun and streetlights**
- **Attached to barricade by tamper-proof bolt**
- **Single screw, always fastened to head, affords easy servicing of lenses and bulb**
- **Rugged 18-gauge steel body**

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COMPANY ____________
STREET ____________
CITY ____________ ZONE ____________ STATE ____________

Volkswagen Truck exhibits versatility at Michigan Museum

Carries birds, bears, and dioramas

© 1961 Volkswagen of America, Inc.

A FLOCK OF BENEFITS. The VW Kombi, as the name suggests, is a combination of station wagon and panel truck. With two seats out, as shown, it's a cargo carrier for birds, bears, charts, exhibits. Total capacity—1,786 pounds. With just one seat out, it carries 6 people and 1,336 pounds of cargo. With all three seats in, it carries 9 people, plus their luggage. And it takes only minutes to make the change.

GRAND RAPIDS
PUBLIC MUSEUM
024129

The Grand Rapids Public Museum uses a Volkswagen Kombi to supply the public schools with visual education materials. Miss Norma Raby, director of the Museum's loan department, has this to say about the Kombi:

"We use it for delivering slide films, photographs, charts, mounted animals, and even display cases and dioramas. It's much more practical for this purpose than the station wagon we formerly used, because it accommodates so many sizes and shapes. We even use it for picking up furniture that's donated to the Museum."

As to performance, Miss Raby went on to say: "We were very much impressed with the Kombi's ability to get through the snow, since we get plenty of it out here. And, of course, it's much more economical than the standard station wagon."

Reports of product satisfaction like this are repeated over and over again wherever you find VW Trucks at work. And that's in all 50 states. There are now over 110,000 VW Trucks in the U. S. Volkswagen is the advanced truck idea that's been proven on the road for the past years.

Are you ready for a VW Truck? You are if you want a truck that costs less to buy, less to operate, and less to service. The suggested retail price of the standard Kombi, without seats, is $1,995, East Coast Port of Entry (West Coast $2,115). To help you make the right decision, talk to your Authorized VW Dealer soon. Ask for a demonstration. And get your free copy of the 60-page illustrated booklet—"The Owner's Viewpoint." It documents with facts and figures VW Truck performance and owner experiences in a wide variety of businesses. It shows what *you* can expect to get from a Volkswagen Truck, too. There's no obligation, of course.

THE COLD FACTS! Air-cooled engine, rear-mounted for superior traction in mud, snow, slush, or ice. No antifreeze, no radiator trouble, no radiator. Torsion bar suspension with trailing links. Road clearance: 9.4 inches. Four speeds forward. Cargo space: 170 cubic feet. Double side doors, 46 inches wide, 47.2 inches high.

GRAND RAPIDS
PUBLIC MUSEUM

How a 4-in-1 can be the "WHOLE WORKS"

FOR YOUR PUBLIC WORKS DEPARTMENT!

Give it power-shovel jobs! Note the ease with which this 3 cu. yd. TD-20 Four-in-One digs up old concrete pavement applying 43,150 lbs. of break-out force. All 5 sizes of International Drott 4-in-1's have famous pry-over-shoe break-out—to take over tough excavating work that formerly required far costlier boom-type rigs!

Benefit from sanitary landfill efficiency no obsolete or limited-duty bucket can deliver. Only the clam-action 4-in-1 provides clam "biting" action, and controlled dozing, to spread refuse evenly. Only the 4-in-1 gives "carry-type scraper" action to cover refuse uniformly on the go—then irons down and seals the cover with compactor plate! "We discovered no competitive equipment that would approach the 4-in-1 method of waste disposal," report the commissioners of Gunyersville, Alabama—the city that owns the TD-9 shown here!

Load 'most anything, anywhere—including sticky materials other buckets can't handle—and on muddy, sandy, rough, or hilly footing which only sure-treading tracks can negotiate! Note that the clam-action 4-in-1 gives exclusive bottom-dumping that ends sticky materials problems. Opening the clam pulls materials from bucket surfaces—gravity down-pull does the rest—for positive self-cleanout dumping!

Let it "double for a dozer" as Colonial Heights, Virginia, does! Here, their TD-9 Four-in-One gives full-size, full-capacity dozing performance filling in an old pond area—to add an acre of more useful land to the city! "Our 4-in-1 cuts the need for several pieces of equipment down to one basic machine," reports Supt. of Streets E. S. Jones!

Do "carry-type scraper" and "grader" work—and get inch-close grading accuracy with the International Drott 4-in-1. This 1½ cu. yd. TD-9 Four-in-One is grading and loading out excess material on 200 lineal feet of new street on the Raleigh campus of North Carolina State College, owner of the outfit. College uses this machine all over the campus for maintenance and new construction.

Produce surfacing materials at new low cost with clam-action 4-in-1 versatility and big capacity. Note how this TD-15 Four-in-One operator "back-drags" select sub-base material down from the bank by the truck-load—for fast, easy loading! Clam-action 4-in-1's do the work of several types of machines in pit or quarry!

Get versatility unlimited—get "equipment spread utility"—for one moderate investment. Get the one machine that can be the "whole works" in your Public Works Department. See how each of the four actions doubles for one or more specialized machines. And each action gives a great range of job-handling working positions. Call your International Drott Distributor for a 4-in-1 demonstration!

Five sizes: ¾, 1⅛, 1½, 2¼ and 3 cu. yd.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

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INTERNATIONAL®
DROTT®

Save on construction costs with the new

'61 FORD TRUCKS

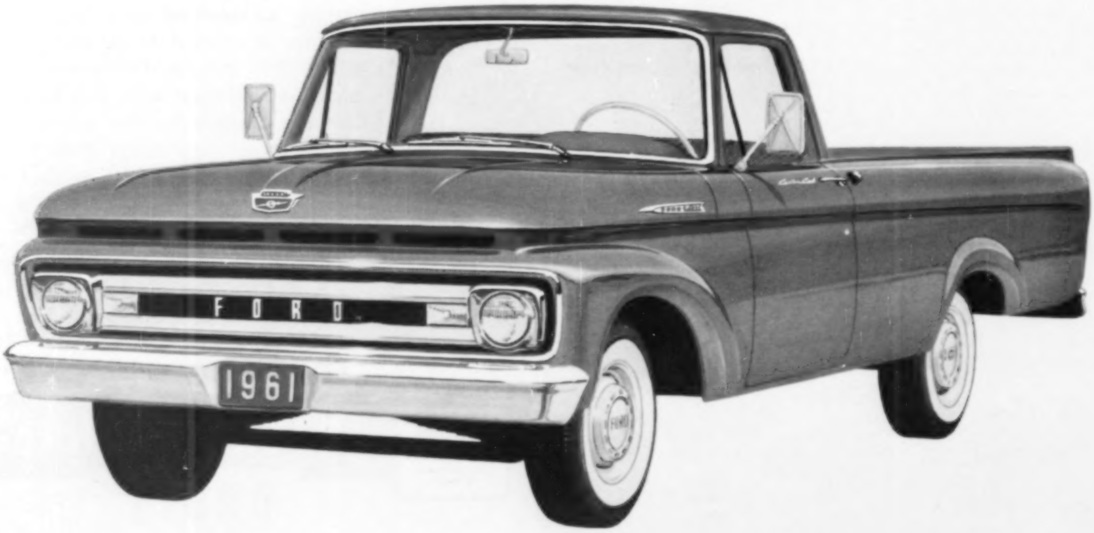
SAVE FROM $31 TO $157 ON PRICE* ALONE WITH FORD'S F-100 STYLESIDE PICKUPS

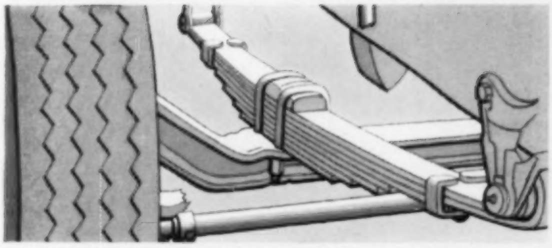
Contractors everywhere are finding that the half-ton Ford Styleside is priced below all other comparable pickups! And these rugged pickups are designed to keep right on saving with lower maintenance and operating expenses. Their durable, one-piece cab-and-box construction provides increased rigidity and eliminates a major source of rust and corrosion. Not only does the sheet metal last longer with this stronger body, but it also contributes to a quieter ride.

And you can save more . . . because you can carry more on every trip. Styleside bodies are longer and wider with loadspace increased as much as 16%. In addition, wheelbases have been lengthened 4 inches and this combined with the improved shock absorbers gives a ride that's unexcelled in its field—proven by scientific Impact-O-Graph tests. For construction work the angle of approach has been increased so you can climb steeper drives or go over deeper ditches or gullies. Ford also offers America's lowest-priced* 4 x 4 with big 8-ft. box, the F-100 Flareside.

And you can save on operating expense! Ford's Mileage Maker 223 Six is standard on all conventional pickups to keep gas costs low. The economical 292 V-8 is available for jobs requiring extra power. Both engines are equipped with Ford's Full-Flow oil filter that lets you get 4,000 miles between oil changes.

**Based on a comparison of latest available manufacturers' suggested retail delivered prices*





SAVE UP TO $250 ON FRONT TIRES! In certified tests of two-ton truck suspensions, Ford front tires lasted over twice as long. In 40,000 miles this saving can add up to $250 . . . more as the mileage increases. And Ford's sturdy I-Beam front axle and leaf-spring suspension not only cut tire wear, but their simpler design also cuts maintenance costs.

12,000 MILE OR 12 MONTH WARRANTY

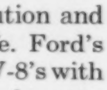
SAVE WITH GREATER DURABILITY . . . on all 1961 Ford Trucks, each part, except tires and tubes, is now warranted by your dealer against defects in material and workmanship for 12 months or 12,000 miles, whichever occurs first. The warranty does not apply, of course, to normal maintenance service and to the replacement in normal maintenance of parts such as filters, spark plugs and ignition points. Never before have you had such protection . . . such evidence of long-term economy!

SAVE WITH FORD'S NEW 262-CU. IN. "BIG SIX" ALL-TRUCK ENGINE FOR TOP PERFORMANCE AND ECONOMY

America's savingest two-tonners offer a big 262 Six with the power of big displacement, the gas economy of 6-cylinder design, plus the durability of heavy-duty construction. This engine features a sturdy stress-relieved block, strong forged steel crankshaft, long-lasting stellite-faced intake and exhaust valves, and durable pyramid-type connecting rods. And Positive Crankcase Ventilation reduces oil dilution and sludge formation to extend engine life. Ford's proven 292 V-8 and 292 HD V-8—the V-8's with "six-like" economy—are also available for your special power needs.

You also save with other new durability features like the more rugged frame, stronger radiator with new lock-seam construction, improved cab and chassis electrical wiring, plus longer, easier-riding and more durable rear springs. Ford's parallel ladder-type frame with standard 34-inch width allows you to install new or transfer your present special construction bodies quicker and for less. Also, the frame drop in the cab area lowers cab height . . . makes for easier entry.

FORD TRUCKS COST LESS



YOUR FORD DEALER'S "CERTIFIED ECONOMY BOOK" PROVES IT FOR SURE...

FORD DIVISION, Ford Motor Company

(Continued from page 5)

with falls from collection trucks. In our Division Safety Meeting, we reviewed the possibility of using an expanded metal for the rear step.

While on first consideration it appeared that this would be an improvement without any inherent liabilities, our Operations people advised us that this was not so. Their previous experience with similar materials indicated that the accumulation of snow and ice created a problem that was more serious than those that arise when the conventional solid sheet-metal materials are used. Whereas a sharp blow from a foot or shovel will break loose the snow or ice accumulation on a solid step, this is not so for expanded metals.

I would be interested in learning whether Tacoma, Wash., or anyone else has experienced any difficulty with snow or ice build-up which would off-set any of the obvious advantages of expanded metal.

Our experience has been that the use of the rear step for transportation to and from routes as well as between routes results in an unnecsary exposure to serious accidents. Therefore, the Division has recently issued orders prohibiting its use for this purpose. Except for travel within a route, all personnel are ordered to ride inside the cab of the truck.

C. J. Reichardt
Chief Design Engineer
Department of Streets
Philadelphia, Pa.

Sewerage Pacts

We have enjoyed the series of articles entitled "Metropolitan Sewerage Pacts" (Oct.-Dec., 1960). I feel you have done an excellent job in coverage of this material which is very timely and I wish to congratulate you on the fine and condensed presentation of the material.

Jess C. Dietz
Consulting Engineer
Urbana, Ill.

Editor's Note: Readers wishing reprints of this series can obtain them by writing to the editors of The American City, 470 Park Ave. South, New York 16, N. Y.

Pedestrian-Mall Parking

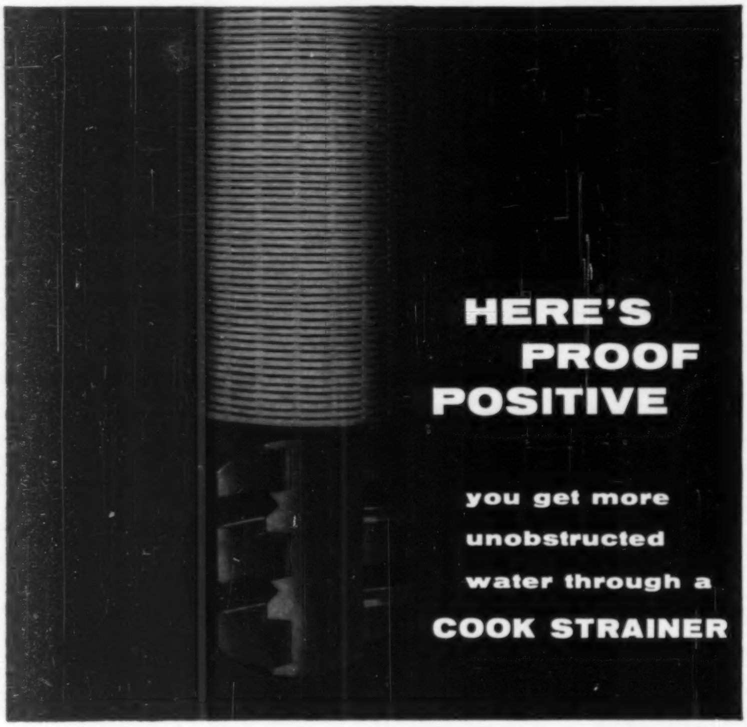
It was interesting to read in your December 1960 issue the article "Merchant Views on Kalamazoo's Shopping Mall" (p. 95). Of the comments from seven local merchants, six were favorable—which seems to me a good batting average and a realistic appraisal.

One statement relative to insufficient parking merits this reply: Kalamazoo's Mall, the first permanent one in America, has enjoyed great success for the two years of its use and has even been extended one block. But in addition, tremendous strides have been made in providing additional parking facilities and actual work is progressing on the peripheral route around the downtown core. Obviously the mall concept is not being applied out of context with other necessary measures.

Our mall has not been a promotional gimmick but rather a spark plug. The Kalamazoo Chamber of Commerce has prepared a report detailing what has been accomplished and what the mall results have been. The chamber will be glad to send copies to readers who may be interested.

James S. Gilmore, Jr.
Mayor
Kalamazoo, Mich.

Editor's Note: Mayor Gilmore is one of the merchants on the mall, and has seen his business gain because of it.



Cook's exclusive V-shaped slot construction permits the most direct water way from the water bearing strata to the well. This time-tested and proven design allows for maximum development of your well by removing silt, alluvium, clay, and fine sand from around the outside of the strainer, thus providing a natural filter of coarser and uniform sand and gravel.

Why not investigate all the advantages of Cook Strainers? They are available in Red Brass, Silicon Bronze, Armco Iron, or Stainless Steel; in as many different slot sizes as required. Eight to twenty-four hours delivery often possible by telephoning Cincinnati HUmboldt 1-8800.

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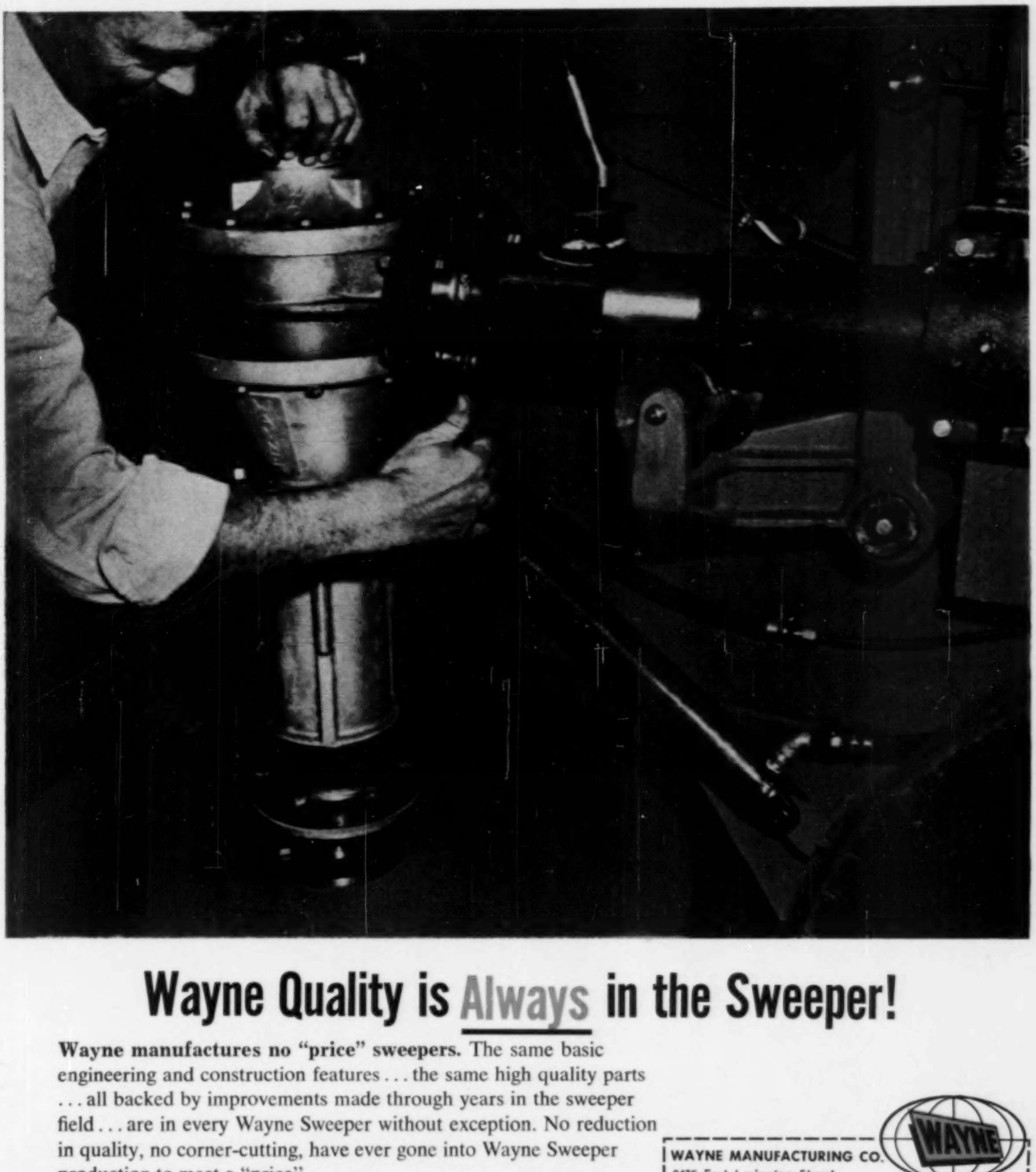

Wayne Quality is Always in the Sweeper!

Wayne manufactures no "price" sweepers. The same basic engineering and construction features . . . the same high quality parts . . . all backed by improvements made through years in the sweeper field . . . are in every Wayne Sweeper without exception. No reduction in quality, no corner-cutting, have ever gone into Wayne Sweeper production to meet a "price."

Regardless of the size or type of Wayne Street Sweeper you buy for your city, there is simply no compromise with quality available from us. You buy only the finest sweeper built, receive only the longest, trouble-free performance, and get the ultimate in pennies-per-mile cleaning—when you buy Wayne!

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JOHN DEERE
JOHN DEERE
720

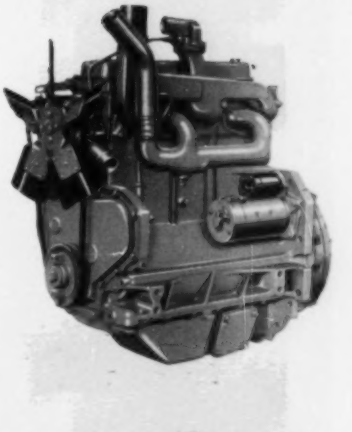
Get set for higher production – lower costs with new

3010 Wheel Power

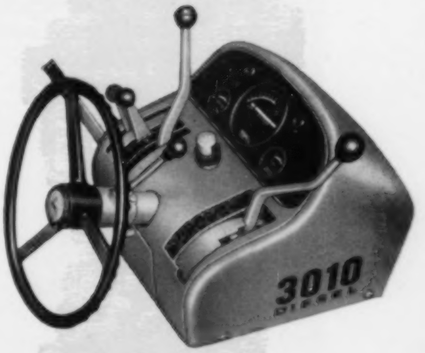
Now—cut the big jobs down to size with an all new 65 engine horsepower John Deere "3010." Move into tough loading and material handling assignments with this smooth-handling wheel loader; tackle major trenching jobs confidently with a "3010"-powered John Deere backhoe.

New Operating Ease: Convenient controls boost productivity of the heavy-duty "3010" Wheel Loader and power-matched backhoes. Single-lever control operates loader lift arms and bucket for rapid handling.

John Deere backhoes operate with simple two-lever control. Flush-digging model 51 has rotary boom cylinder which centers or slides to any of four off-center positions, moved by the unit's own hydraulic power.



Gasoline or Diesel Power: All-new John Deere 4-cylinder, 4-cycle overhead valve engines feature cam-ground aluminum pistons, high-turbulence combustion chambers for thorough fuel-air mixing, top efficiency. Replaceable-sleeve design for easy servicing. Large manifold insures free breathing at every speed. Exclusive forced engine ventilation. Full-pressure lubrication system with full-flow oil filter. Exhaust-valve rotators.



Modern Platform, Control Design: Clean, functional "command post" assures all-day operator comfort and efficiency. Deluxe seat adjusts to operator's weight. Large clear platform makes mounting, getting down, fast and easy. Hydraulic controls conveniently located for smooth operation. Constant mesh transmission—8 speeds forward and 3 reverse, for any power requirement. Power steering, power brakes. Low-profile design provides high machine stability, excellent operator vision.

For a demonstration of new John Deere "3010" Wheel Power, contact your John Deere Dealer through the yellow pages of your telephone directory.

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JOHN DEERE LOADERS BULLDOZERS BACKHOES AND EARTHMOVING EQUIPMENT

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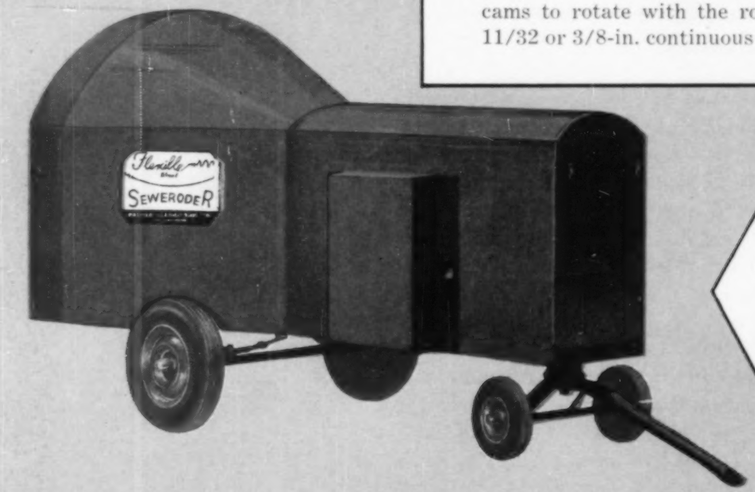
Flexible presents 3

Before you invest important money in sewer rodding equipment, investigate these three fine new machines. As in the past, Flexible has taken proven and tested design principles, and added important new features to give you the best equipment for any job.

As a manufacturer of **all** types of rodding machines, Flexible is in a position to offer you **any** type without partiality. The work to be performed is the determining factor for most satisfactory machine selection.

Now! A simplified continuous rodder free from slippage when the going gets heavy, with the exclusive advantage of the proven Safety Overload Clutch. NO FRICTION ROLLERS TO SCORE OR BURN. Traveling cams positively push or pull the rod, gripping tighter when the load increases. Unequaled design permits cams to rotate with the rod, in either direction. For 1/4, 5/16, 11/32 or 3/8-in. continuous rod. Holds up to 2000 ft.



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1961

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Built with the ruggedness and reliability of the full-size SeweRodeR, this new Compact is 15 inches shorter and priced to fit economy budgets. Uses 39-in. rods driven by hardened steel dogs on positive dual chain drive. Two-wheel tow with caster type wheel at front; 7 hp engine; reel capacity 750 ft. of rod.

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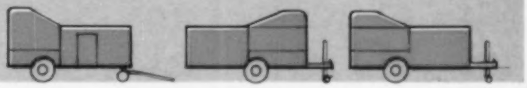

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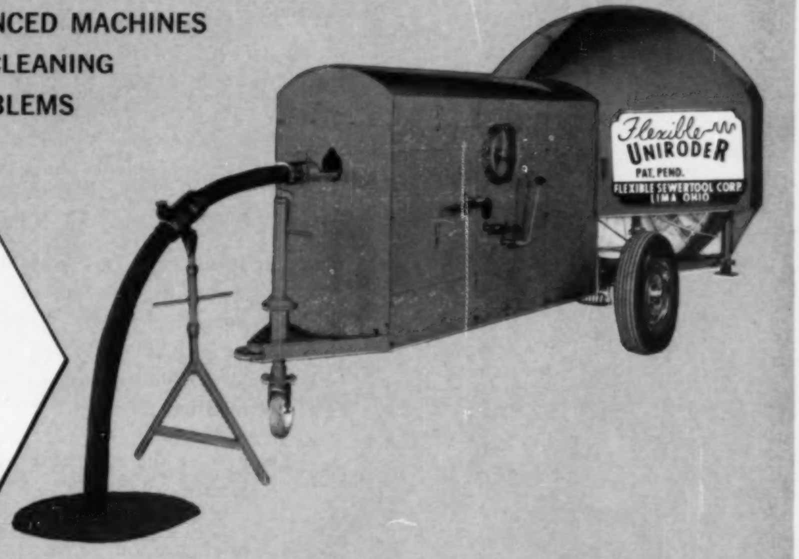
1961's MOST ADVANCED MACHINES FOR YOUR SEWER CLEANING AND RODDING PROBLEMS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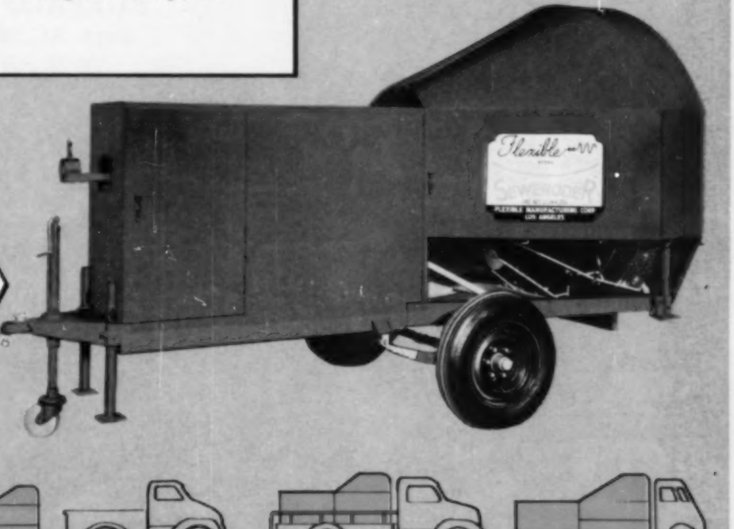
Now features 48-in. rods providing extra operational economies. Twice as many drive dogs on new longer dual chain drive for faster, smoother, positive power. These and other redesign features make it the greatest performer on the market today . . . all at no increase in price over previous years. Engine 9.2 hp; reel capacity 900 ft. of rod.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COMPACT

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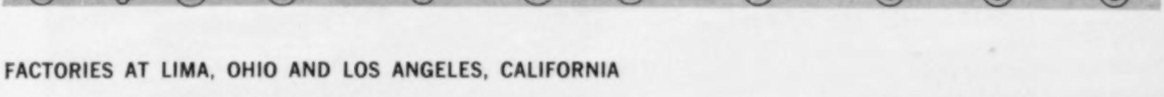
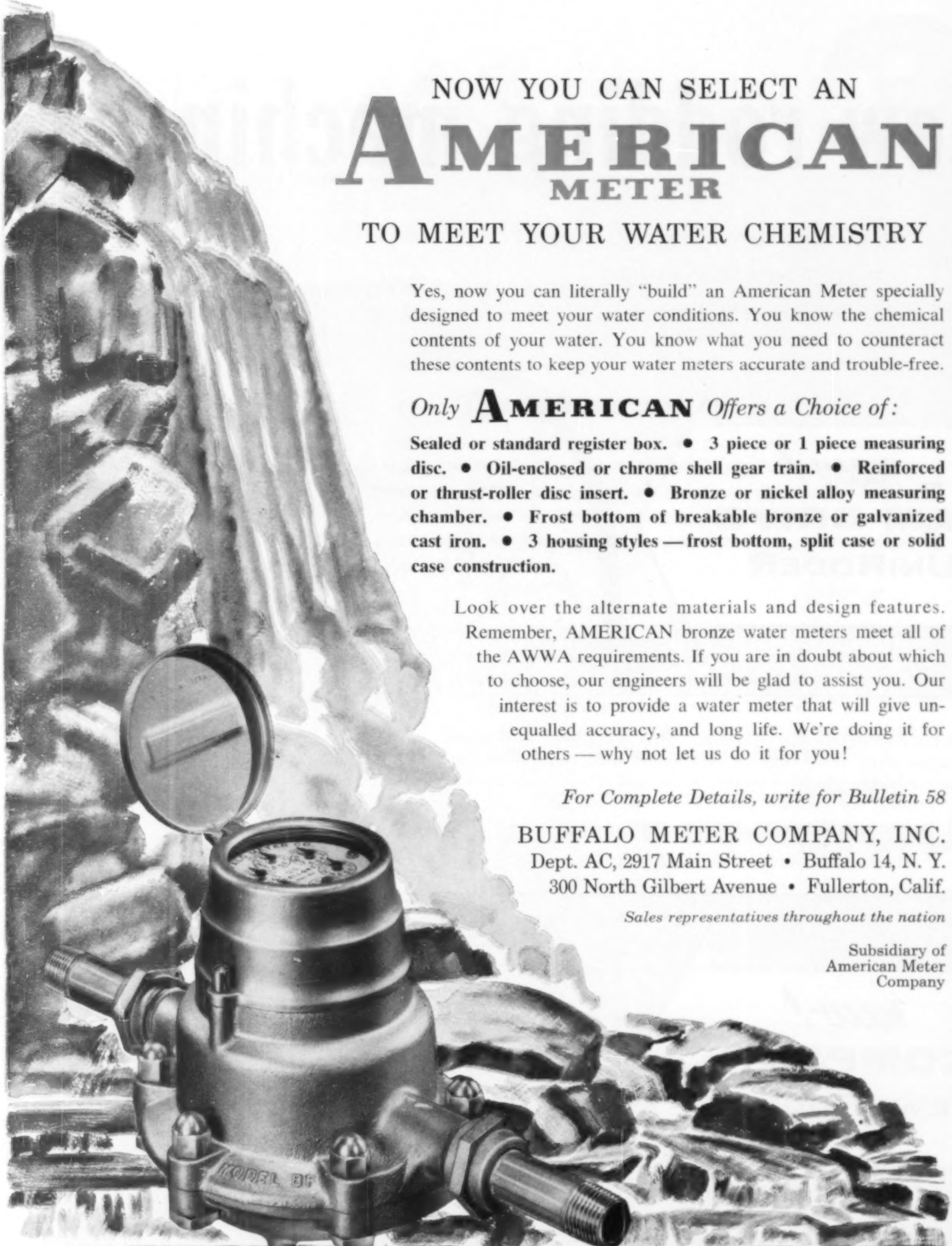


FACTORIES AT LIMA, OHIO AND LOS ANGELES, CALIFORNIA



NOW YOU CAN SELECT AN AMERICAN METER TO MEET YOUR WATER CHEMISTRY

Yes, now you can literally "build" an American Meter specially designed to meet your water conditions. You know the chemical contents of your water. You know what you need to counteract these contents to keep your water meters accurate and trouble-free.

Only AMERICAN *Offers a Choice of:*

Sealed or standard register box. • 3 piece or 1 piece measuring disc. • Oil-enclosed or chrome shell gear train. • Reinforced or thrust-roller disc insert. • Bronze or nickel alloy measuring chamber. • Frost bottom of breakable bronze or galvanized cast iron. • 3 housing styles — frost bottom, split case or solid case construction.

Look over the alternate materials and design features. Remember, AMERICAN bronze water meters meet all of the AWWA requirements. If you are in doubt about which to choose, our engineers will be glad to assist you. Our interest is to provide a water meter that will give unequalled accuracy, and long life. We're doing it for others — why not let us do it for you!

For Complete Details, write for Bulletin 58

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Hurricane Antidote

After Hurricane "Donna" moved on, the Town of Guilderland N. Y.,* put one of its most versatile pieces of equipment to work — a Hough Model H-50 Payloader with a Drott 4-in-1 bucket and a Wain-Roy backhoe. Storm clean-up and repair work included such jobs as clearing ditches of debris, filling-in around badly eroded culverts, and cleaning storm-littered areas. During normal times the unit performs a variety of tasks, such as sloping banks, loading-out brush material and stumps, and clearing right-of-way. ◄◄

*Box 160, RD1, Albany, N. Y.

Enlarged Sewage-Purification Policy

To assure the conservation and protection of the nation's water resources, the Water Pollution Control Federation believes:

That the discharge of pollution wastes into the waterways of the nation should be controlled.

That the type and extent of treatment and control for any specific situation must be determined after consideration of the technical factors involved.

That the responsibility for the adequate treatment and control of wastes to overcome pollution must be shared individually and jointly by industry and local, state and federal governments.

That basic and applied research by competent personnel must be encouraged by broad mutual effort to develop new knowledge that will solve water-pollution problems.

That the administration of pollution control must be firm, effective and equitable.

That the administration of state and interstate pollution control programs should remain in the hands of state and interstate water-pollution-control agencies, supported by increased budgets and adequately staffed by well-trained and compensated engineers, scientists and other personnel.

That the primary objective of pollution control is the protection of the public health, with other objectives adding impelling reasons for water-resources protection.

That federal activity in water-pollution control should be administered by the Public Health Service which is fitted to perform these functions, by virtue of its long experience and close cooperation with state health departments and state and interstate water-pollution-control agencies.

That the public must be made fully aware of the hazards of pollution and of the workable means for control, so that it will sponsor and support construction and proper operation of all necessary facilities.

That mandatory certification or licensing of better trained and compensated operating personnel is ultimately the best means for assuring the most effective operation and maintenance of pollution-control facilities.

That standards for radiation hazards in water-pollution control should be primarily in the interest of the protection of the public health.

That the control of toxic and exotic chemicals should be exercised, to the maximum extent practicable, at the source in order to prevent problems in water-pollution control.

That federal, state and local fiscal laws and practices should be devised and modified to assure the most economical and effective means for financing the construction, operation and upgrading of waste-water treatment works. ◄◄

EDITOR'S NOTE: A statement of policy adopted by the Board of Control of the Water Pollution Control Federation.

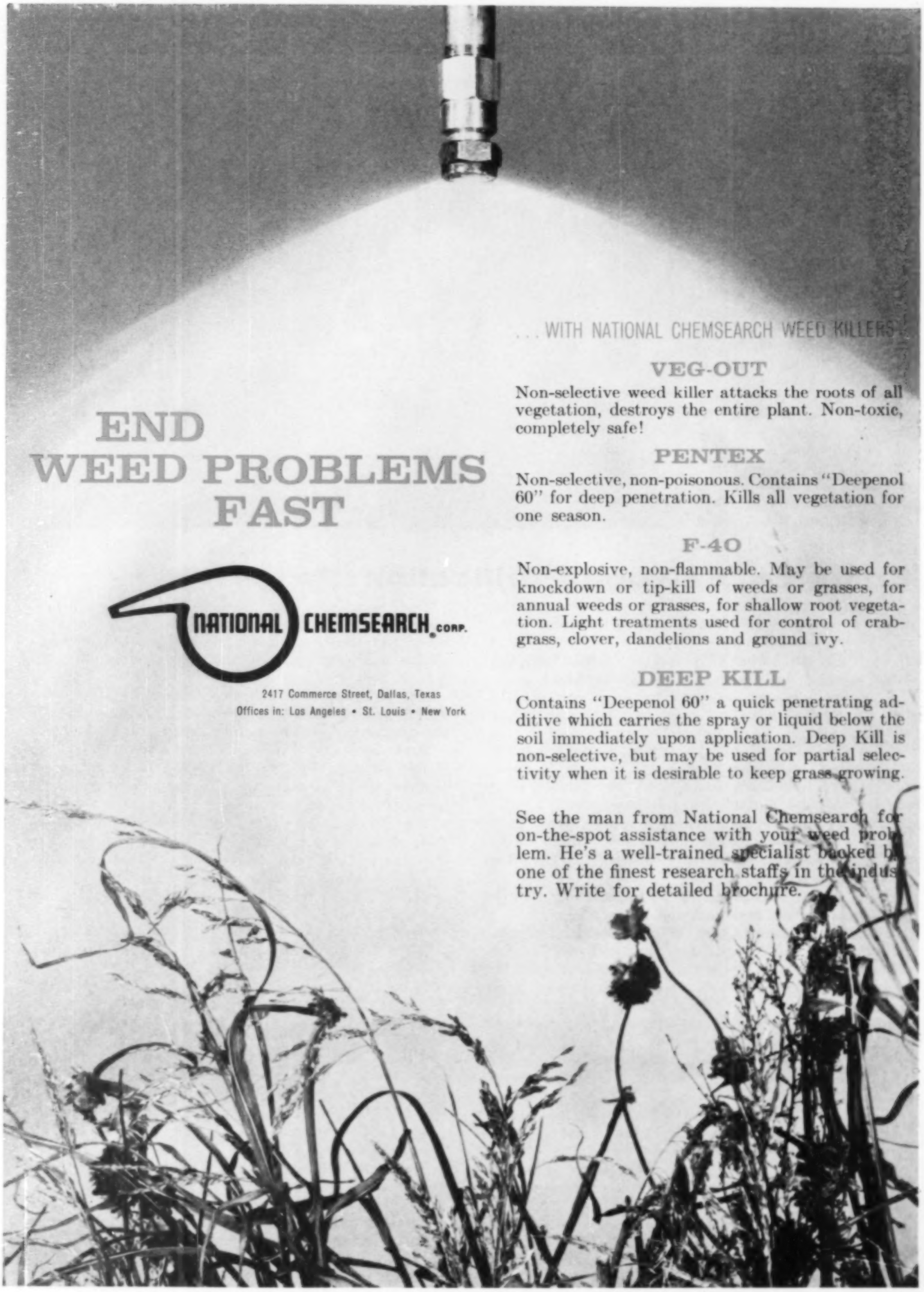
Pennsylvania Leads In Sewerage Contracts

Pennsylvania led the nation in contract awards for new sewage treatment plant construction in 1959. Municipalities in this state awarded contracts totalling $11,379,397 last year for new sewage purification plants, or more than 10% of the national total of $95 494,463.

Contracts represent new sewage purification plants for 28 municipalities and for 11 schools.

In 1958 the value of these contract awards in Pennsylvania totalled $10,491.359.

Other leading states include California ($8,600,000), Ohio ($7,400,000), Tennessee ($5,900,000) and Florida ($5,300,000). ◄◄



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VEG-OUT

Non-selective weed killer attacks the roots of all vegetation, destroys the entire plant. Non-toxic, completely safe!

PENTEX

Non-selective, non-poisonous. Contains "Deepenol 60" for deep penetration. Kills all vegetation for one season.

F-40

Non-explosive, non-flammable. May be used for knockdown or tip-kill of weeds or grasses, for annual weeds or grasses, for shallow root vegetation. Light treatments used for control of crabgrass, clover, dandelions and ground ivy.

DEEP KILL

Contains "Deepenol 60" a quick penetrating additive which carries the spray or liquid below the soil immediately upon application. Deep Kill is non-selective, but may be used for partial selectivity when it is desirable to keep grass growing.

See the man from National Chemsearch for on-the-spot assistance with your weed problem. He's a well-trained specialist backed by one of the finest research staffs in the industry. Write for detailed brochure.

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Offices in: Los Angeles • St. Louis • New York

Miami Gets Surplus Plane For Kiddie Park

Ducklings
NO. 1
EASTERN

A real treat for Miami's youngsters, the aircraft is constantly in use.

The pilot project of "Operation Ducklings" brought to Miami's Grapeland Heights Park a surplus aircraft for educational and recreational purposes. Dedicated early in 1961, this new park attraction enables prospective pilots to sit in the captain's seat, man the controls, and do many other operations short of actually taking off. A recording of an actual take-off, with pilot's and control-tower operator's voices, completes the illusion.

Local airline pilots saved the Navy plane, a P2V-3 Neptune, from an Arizona scrap heap by donating their time and efforts to have it dedicated to the city. Naval personnel flew the plane to Miami International Airport and stripped it of all electronic equipment and usable parts. An all-night trip of 20 blocks to the park, no small operation in itself, brought the aircraft to its final resting place.

Volunteer mechanics and painters from Eastern Air Lines and employees of the Miami Parks Department took over the job of making the plane safe and attractive. The construction of a safe entrance and exit, anchoring the plane to the ground, painting and other related jobs readied the aircraft for its new role.

Mayor Robert King High accepted the dedication of the million-dollar surplus aircraft, explaining that this was the first plane to be delivered to any city in the United States under the new program. Since the installation 35 cities have inquired of Pilot Jim Mathews of Eastern Air Lines about the method of obtaining a surplus aircraft for their parks. ◄◄

Park Purchase on the Installment Plan

The Maryland-National Capital Park and Planning Commission uses an installment-purchase plan to provide adequate park and recreation areas in upper Montgomery County, Maryland, for future generations of county residents. The agency, which has jurisdiction over approximately 700 square miles in Montgomery and Prince George's Counties adjacent to the District of Columbia, is faced with the all-too-common problem of insufficient money. About 20,000 people move into the two-county area every year and the Commission is hard-pressed to keep pace with the mushrooming development.

The Commission has already bought a total of 5,600 acres of park land to serve the more heavily populated urban sections closest to Washington, D. C. However, the agency was concerned over the preservation of open spaces in areas which are in the path of housing-development bulldozers. For this reason the Commission devised its plan to buy park land in installments in areas which are now rural but which developers might soon plat unless steps are taken to preserve them for the future.

The agency, through Park Director John P. Hewitt, has already signed contracts to buy two large farms under this plan. One of the tracts, containing 312 acres, has a one-mile frontage along the Potomac River near Poolesville. The agreement calls for the Commission to buy at least 30 acres, at $325 an acre, each year for five years. At the end of that period the two parties will agree on a price for acquiring the remaining land. The second farm of 157 acres extends along Cedar Heights Road just south of Damascus. This contract requires the Commission to buy 26 acres immediately for $10,000 and to acquire the remainder at the rate of 13 acres annually for ten years at $382 an acre.

As the result of its new procedure, the Commission succeeds not only in reserving future park land, but buys it at reasonable prices.

Eventually, the Commissioner plans to acquire an additional 6,000 acres in upper Montgomery County, which should assure the next generation of adequate facilities. The tracts will range in size from 200 acres to 2,000 acres and will be financed on a pay-as-you-go basis by proceeds from the agency's five-cent park tax in rural areas. ◄◄

NOW you can get
① COMPLETE SEWER ODOR CONTROL
② FREE APPLICATION EQUIPMENT
with

ZEP-O-BAN

heavy duty deodorant

Zep
FIRST IN MAINTENANCE PRODUCTS
ZEP
ZEP-O-BAN

Odor control in your city's sewage system no longer will be a problem . . . or major expense . . . with Zep-O-Ban. The value of this emulsifiable chlorobenzene in odor suppression is well-established. Its stable, concentrated liquid form permits use in solutions diluted enough to make yearly cost low, yet strong enough for positive, three-way odor control. It effectively masks existing odors . . . prevents others by destroying sulphide-producing micro-organisms . . . controls growth of fungi which speed waste decomposition. Normal treatment consists of one to five parts Zep-O-Ban for each million parts sewage or industrial waste as it enters collection system. This chlorobenzene/sewage ratio does not affect natural anaerobic processes or efficiency of activated sludge.

FREE ZEP-O-BAN DISPENSER

regulates deodorant flow automatically

Initial setting of float and metering valve—to suit sewage flow of your installation—makes unit automatic . . . no constant checking . . . no valve adjustments because of irregular flow . . . ideal for unattended lift stations, disposal plants. Regulates flow accurately . . . from as low as *5 drops per minute!*

For further information about Zep-O-Ban and how you can get a free dispenser, call or wire collect our office nearest you.

Zep

MANUFACTURING CORPORATION

***FIRST** in Maintenance and Sanitation*

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CLEVELAND
13112 BROADWAY
NEWARK
231 JOHNSON AVENUE

A Big Machine For a Big Job

For the last ten years Waterloo, Iowa, has disposed of refuse contributed by its 70,000 citizens by the sanitary-landfill method at one location. An International Drott TD-20 Four-in-One unit compacts the refuse and covers it at the 75-acre site. According to present estimates the site should serve for another ten years. ◄◄

Annexation Requires Refuse Changes

In the light of two proposed annexations which will increase the present 27-square-mile area by 200% and the present 111,000 population by 62%, Knoxville, Tenn., is currently examining its refuse-collection and disposal system to ascertain what changes will have to be made. Neither annexation is expected to be completed until early next year but planning and the 1962 budget dictate the necessity of current investigation.

The proposed annexations will add a doughnut-shaped area of unequal width to the center city. Because this new area contains no business districts comparable to downtown Knoxville, no change is anticipated in this type of collection. A Dempster-Dumpster GRD currently collects refuse nightly from Dempster containers which are purchased by the individual merchants. This refuse is then dumped into a Model DB-42 Dempster Compaction Trailer, which can accumulate about 160 yards, loose volume. Industrial wastes are collected by private haulers.

The present fleet of 17 collection compaction trucks, consisting of Leach, Gar Wood and Dumpmaster bodies on Chevrolet and Ford chassis, will have to be expanded. Furnishing comparable once-a-week collection to the new residential areas will necessitate a complete route overhaul, taking into account not only area but also the density of population. The present budget specifies $244,098 for labor, maintenance and operation of all refuse collection. The new budget will have to be higher but not in proportion to the increase in population.

Collection from outlying businesses and shopping centers is on an "as-necessary" basis and averages three pick-ups per week. The residential route trucks make the necessary stops as a part of their regular duties. No change is contemplated in this system as a result of the proposed annexation.

Knoxville operated sanitary landfills even before World War II. The current landfill is located two miles east of the city on a major highway. Annexation will bring the city limits to within one-half mile. The present capacity of almost 400 acre-feet in this newly-opened landfill is expected to last nearly four years. Because the landfill is open 24 hours per day (with the services of a watchman only during the night), it is sprayed with a Sanfax fly-control solution during the summer. Only those persons without a Knoxville city license tag are denied the privilege of dumping; consequently, many loads are dumped when the Caterpillar D-7 tractor is not being operated. Annexation will probably require the opening of a second landfill on the west side of the city as an economy measure to shorten the haul.

Roy Gentry
Director of Public Service
Knoxville, Tenn.

Tighter Controls on Refuse Burning

The Bay Area Air Pollution Control District (San Francisco) reports that only 1% or 200 of the 20,000 non-home incinerators located in the Bay Area in 1960 met the design requirements imposed by the new strict Air Pollution Control Regulation 2. This regulation became effective January 1, 1961. These single-chamber units, located in industrial, commercial and institutional buildings and multiple dwelling units, contribute an estimated 40 tons per day of dusts and droplets and 200 tons per day of organic gases to the atmosphere.

Also under surveillance are about 1,000 medium and smaller operations which include industrial-chemical plants, foundries, petro-chemical plants, and mineral processing plants. These plants include sand and gravel, asphalt-batch and metal finishing plants. Three hundred of these plants need to do control work.

District officials calculate that full compliance with Regulation 2 will take about three years and will result in a reduction of 173 tons a day of particulate matter and 314 tons a day of undesirable gases in the atmosphere. This is in addition to the estimated 25 tons a day of particulates and 600 tons a day of undesirable gases no longer entering the atmosphere because of Regulation 1. This open-burning control regulation has been in effect since October, 1957.

Block-by-block surveys and other investigations now being made will give the District a clear picture of the situation to date. Those who fail to comply with the regulations will be called before the District's Hearing Board and finally the Superior Court. An estimated investment of $12,000,000 by industry in the area over the next five years will be required to comply with the strict regulation. ◄◄

Rising costs were plaguing Green Bay, Wisconsin's street name sign system. Then Director of Public Works Francis J. Euclide talked it over with 3M. "When I had the facts," he recalls...

"I SAW HOW 'SCOTCHLITE' SHEETING WOULD SAVE MONEY FOR GREEN BAY"

When reconditioning street name signs begins to cost more than buying new ones, something must be wrong. So thought Director of Public Works Francis J. Euclide of Green Bay, Wisconsin, about three years ago.

"I remember the day," he says, "that I discussed our problem with the 3M salesman. He gave me the costs of a different system: making and maintaining all our signs with 'Scotchlite' Reflective Sheeting. I checked his figures against my own costs. It was obvious. In the long run 'Scotchlite' Sheeting would save money for Green Bay."

And so it has. A one-man shop, centered around a "Scotchlite" Vacuum Applicator that bonds reflective sheeting to aluminum blanks, turns out low cost, first quality signs as quickly as they are needed. No more waiting weeks, even months, for sign delivery.

Maintenance is simplified and less expensive, too. The aluminum is easily reclaimed, requires no priming, and can be quickly refaced with pre-cut reflective letters and backgrounds.

While sign costs dropped in Green Bay, sign performance immediately went up. For street name signs of "Scotchlite" Sheeting are brightly visible, clearly readable in headlight beams. They never leave motorists in the dark.

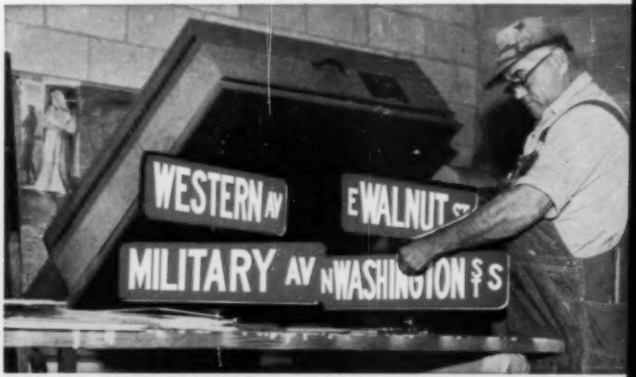
Have *you* looked at your street name sign system lately?

HIGH COST OF MAINTENANCE on signs like this led Green Bay to switch to "Scotchlite" Sheeting. It used to take six men all winter to respray the old backgrounds and letter new legends by hand. If signs were bent, they chipped, rusted, and had to be thrown out.

REPLACEMENT WITH "SCOTCHLITE" Sheeting, applied to aluminum panels, has proved to be a money-saver. Today one man in the Street Dept., Charles Lauscher (right), makes and maintains all signs for an entire city of 63,000 people. If these chip-resistant, rust-proof signs are ever bent, they are easily straightened and returned to duty.

WESTERN AV
MILITARY AV

WESTERN AV
MILITARY AV



KEY TO FAST SERVICE in Green Bay's new signing system is the "Scotchlite" 3' x 4' Vacuum Applicator. "Before," Mr. Lauscher says, "it sometimes took two months to get a replacement sign. Now, if a home owner complains about a sign that has been vandalized, I can bring it in, apply a new face in the applicator if necessary, and have it back on the job—all within an hour or two."

SPECIAL SAVINGS! Save up to 10% on street name sign materials. Save $51.00 on the "Economist" Applicator. Offer expires March 31, 1961. See your 3M Representative or write Dept. RBK-31, 3M Co., St. Paul 6, Minn.

SCOTCHLITE®
BRAND
REFLECTIVE SHEETING

MINNESOTA MINING AND MANUFACTURING COMPANY
...WHERE RESEARCH IS THE KEY TO TOMORROW
3M COMPANY

"SCOTCHLITE" IS A REGISTERED TRADEMARK OF THE 3M COMPANY

New Officers
For AWWA

William D. Hurst
Vice-President

John W. Cramer
President

William J. Orchard
Treasurer

The Board of Directors, American Water Works Association, at its annual meeting in New York, nominated the following slate of candidates:

For President: John W. Cramer, senior partner in the consulting firm of Fulton & Cramer, Lincoln, Neb. Now serving as Vice President of AWWA, he has been a member since 1948 and for three years represented the Nebraska Section of the Board of Directors.

For Vice-President: William D. Hurst, city engineer and chairman of commissioners of the Greater Winnipeg Water and Sanitary Districts, Winnipeg, Manitoba, Canada. Hurst is a Past President of the American Public Works Association and has been active in all phases of public works. During his 27 years as a member of AWWA he served as chairman of the Minnesota Section and Canadian Section and represented Canada on the Association's Board of Directors.

For Treasurer: William J. Orchard, retired general manager of Wallace & Tiernan, Inc. Well known to practically all AWWA members, he has been with the organization since 1917. His services include membership on many committees, four three-year terms as a director, chairman of the finance committee since 1951 and a member of the Association's executive committee since 1945. He was made an honorary member in 1937 and he received the Diven Medal in 1954, the Harry E. Jordan Award in 1956, and the Fuller Award from the New Jersey Section in 1958. He has been Treasurer since 1957.

They will begin their term of office at the Association's 81st annual conference to be held in Detroit, Mich., June 4th to 9th. ◄◄

Official Emblem for Certified Operators

A distinctive lapel pin, originally designed to encourage water and sewage plant operators to take their certificate of competency examination at the Southwest Texas Regional Short School, now serves as the official emblem of certified operators. It is something to let the people know that qualified men operate their water and sewerage systems.

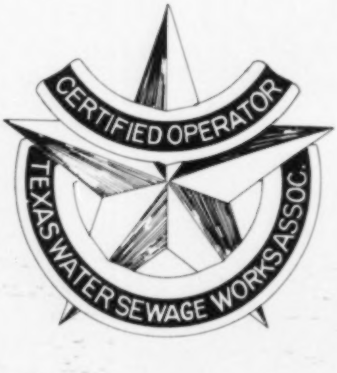
The men become qualified through an extensive training program conducted throughout Texas. Schools participating in the program include the annual Texas Water and Sewage Works Association's Short School, five regional short schools, and the Texas A & M Engineering Extension Service. The manual for water works operators and the manual for sewage works operators, two widely used manuals published and distributed by the Texas Water and Sewage Works Association, serve as texts for the study program.

The first annual short school, held over 40 years ago, had 12 people in attendance. Last year over 800 persons attended.

Four of the five regional short schools, three days in length, are held in Lubbock, Arlington, Tyler, and Beaumont and the fifth is held in a different city in South Texas each year. These courses stress the basic principles of water and sewage works operation. In addition, Texas A & M Extension Service field instructors travel over the state conducting courses in water and sewage works operation. Classes are usually held four nights a week for two weeks.

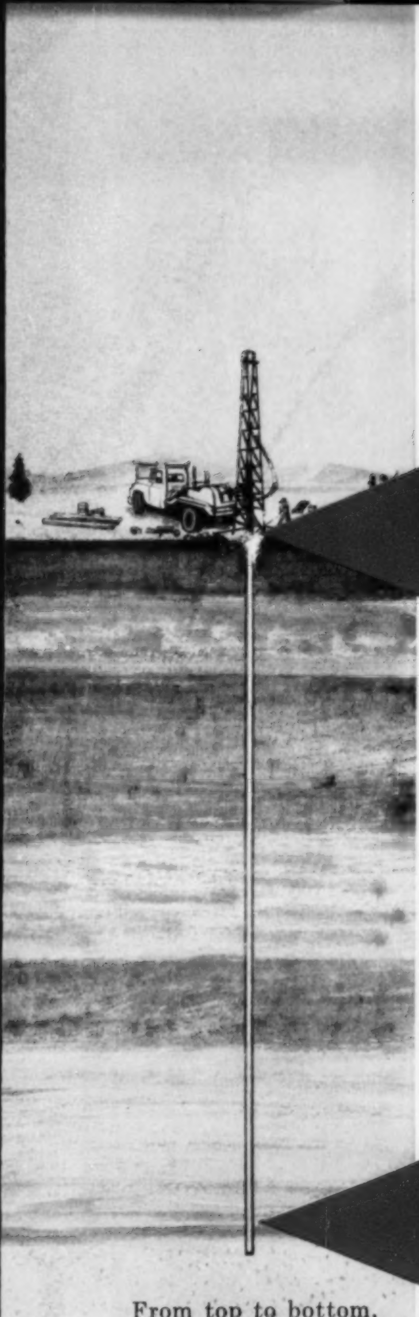
Many operators attend these varied classes on their own time and at their own expense. They are interested in their work and take pride in becoming qualified operators in order to keep the water supplies safe and the sewerage systems working at top efficiency. The Texas Certified Operator Pin gives these men the recognition they deserve.

This gold-and-blue lapel pin serves as the official emblem of certification and is presented to those Texas water and sewage plant operators who have successfully completed the certification examination.


CERTIFIED OPERATOR
TEXAS WATER SEWAGE WORKS ASSOC.

Don Kincannon

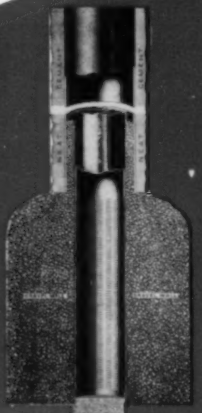
Mr. Kincannon holds the title of Junior Engineer, Operators' Advisory Programs, Division of Sanitary Engineering, Texas State Department of Health.



Layne
SINCE 1882

has the only complete service that means Water

Layne Vertical Turbine Pumps are designed, engineered and manufactured by Layne in Memphis, Tennessee and nowhere else. Because pumping needs vary, there is a Layne pump for every pumping requirement—from 30 to 100,000 C.P.M. in sizes from 4 to 42 inches. Layne Pumps include Deep Well and Short Coupled (oil or water lubricated), Propeller, Mixed Flow, Regular and "In-Line" Submersible. For additional information write for bulletins 200-oil lubricated or 201-water lubricated.



The Layne Gravel Wall Well is an example of Layne experience, engineering and research. This gravel packing and 134 shutter screen employment affords larger screen openings, reduced friction, reduced draw down and pumping head. It increases specific capacity and makes for more effective retention of native sands. For additional information write for bulletin 900.

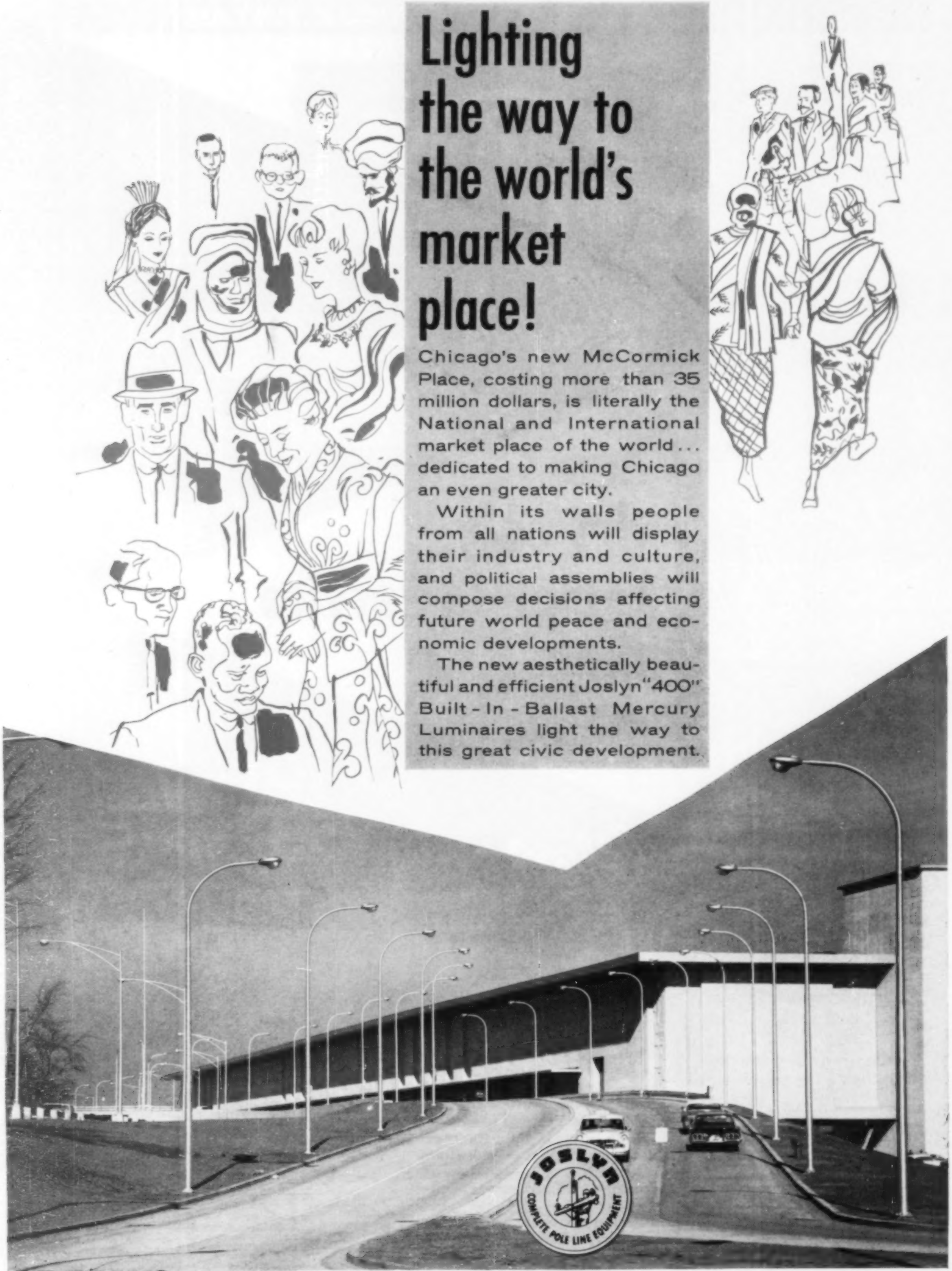
From top to bottom, you can depend on Layne for the most complete water service in the industry. This complete service provides undivided responsibility for the delivery of water . . . of the quality and in the quantity required. Over 75 years of *growing* service gives the skill and technical know-how which makes Layne First in the field of water. For additional information write for bulletin 10.

LAYNE
OFFERS COMPLETE
WATER SERVICE:

Initial Surveys • explorations • recommendations • site selection • foundation and soil-sampling • well drilling • well casing and screen • pump design, manufacture and installation • construction of water systems • maintenance and service • chemical treatment of water wells • water treatment—all backed by Layne Research.
Layne services do not replace, but coordinate with the services of consulting, plant and city engineers.

Layne
SINCE 1882
COMPLETE
WATER SERVICE

LAYNE & BOWLER, INC., MEMPHIS
General Offices and Factory, Memphis 8, Tenn.
LAYNE ASSOCIATE COMPANIES THROUGHOUT THE WORLD
SALES REPRESENTATIVES IN MAJOR CITIES



Lighting the way to the world's market place!

Chicago's new McCormick Place, costing more than 35 million dollars, is literally the National and International market place of the world... dedicated to making Chicago an even greater city.

Within its walls people from all nations will display their industry and culture, and political assemblies will compose decisions affecting future world peace and economic developments.

The new aesthetically beautiful and efficient Joslyn "400" Built-In-Ballast Mercury Luminaires light the way to this great civic development.

JOSLYN MFG. AND SUPPLY CO. 155 N. Wacker Drive, Chicago 6, Illinois

Fire Chief Gibb Farrish and Mayor Applebaum look over the new B&B Engineering fire-alarm control switchboard.

Yazoo City Learned Fire Safety

Historic Yazoo City, Miss., has been razed by war (Civil), ravaged by fever (Yellow), and devastated by fire (324 buildings burned in hours).

That fire was in 1904 but its memory has lingered on. It made ashes of two-thirds of the assessed valuation of all real and personal property. The waterworks system was inadequate as were the river and cisterns. Consequently men and equipment rushed from other Mississippi cities could do little.

Yazoo City went to work to build a water supply and distribution system unsurpassed by any in the state and to create a paid, full-time fire department.

Main Street was widened six feet and new streets and alleys were opened. Outlawed forever were wooden awnings and wooden buildings of any nature in the business district. Utility poles and wires were moved to the alleys.

Water from artesian wells was stored in a covered concrete reservoir 140 x 90 x 32 feet deep. For emergency or industrial use, water could be pumped through a 16-inch line from the Yazoo River. That river system provided enough pressure so that a fire hose placed on the highest hill in town could shoot a stream of water 60 feet into the air. Using the reservoir supply, a stream could be shot 85 feet into the air. The water distribution and fire protection systems were said to be adequate for a city of 30,000.

All this had come about by 1905. The next disaster was the 1927 flood which covered most of the city, but the citizens survived.

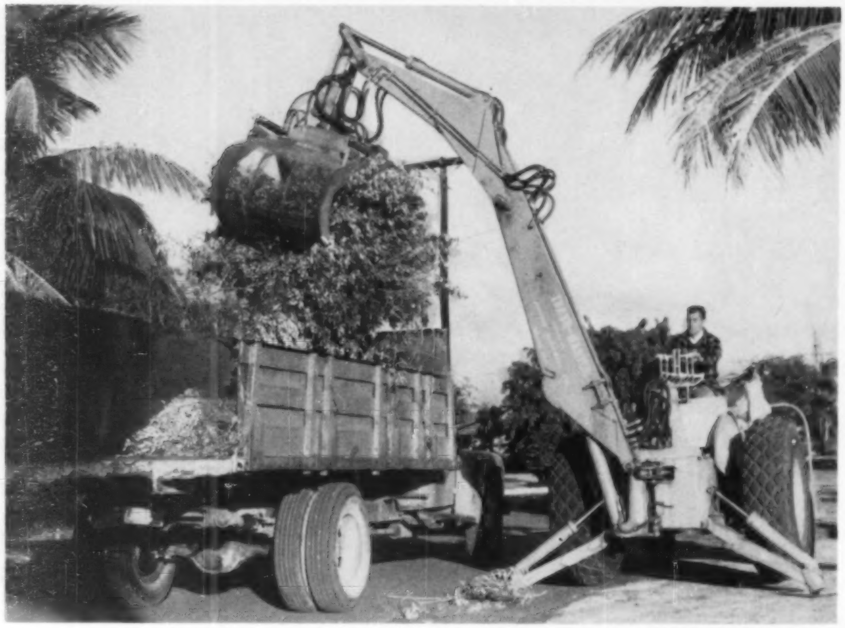
Today, Yazoo City boasts of a large, integrated power system, owned wholly by the citizens, a water works with a downtown static pressure of 105 pounds, numerous parks and playgrounds. In part of the site of the old Confederate navy yard is now arising a modern, industrial park. Invasion today is not from northerners carrying muskets but from northern and eastern industrialists carrying plans and specifications for heavy industry.

Through all the adversities, the fire department rendered its best. A recent installation of a modern fire-alarm central office rounded out the program of rehabilitation. Chief Gibb Farrish's seven-year administration shows all fire stations in good repair, all equipment modern, personnel trained, with the average age of the personnel 33 years. There are 20 men, the Chief and Assistant Chief, three fire stations and four companies.

HARRY APPLEBAUM
Mayor

Phoenix Fire Alarm Improved

Recent improvements to the Phoenix, Ariz., fire-alarm system include installation of an additional 2,000 feet of underground cable, removal of old aerial fire-alarm wire, and conversion of the mobile radios of the former South Phoenix Fire Department. The installation of the 2,000 feet of underground cable brings the total footage of city-owned underground cable to 231,000 feet. This cable serves 49 fire alarm boxes in the downtown area and four fire stations. Other fire stations are tied into the alarm system through cable leased from the telephone company. While the underground cable was being installed, nearly 80 miles of aerial fire-alarm cable, no longer in use, were removed by a private company at a cost of $9,700. The conversion of the six mobile radio units of the former South Phoenix Fire Department to the Phoenix Fire Department radio frequency brought the entire fire department under one radio frequency and completed the integration of the two fire departments.



The swivel bucket permits the operator to deposit trash into the truck at any angle to avoid spillage.

Quicker Service — Cleaner Streets

Streets are cleaner in Delray Beach, Fla., now that city crews are using a new specially designed clean-up tool to pick up lawn, tree and shrub clippings piled at the front of the property.

The Trash-Master, first of its kind and built by Jupiter Equipment, Inc., 859 N. E. 121st St., North Miami, Fla., steps up collections from 250 to 1,000 cubic yards a day. As a result, the city maintains weekly rather than monthly collections at no increase in cost.

The unit consists of a hydraulic-operated boom-and-bucket attachment fitted to a Ford industrial tractor. The 22-foot extendable power boom can swing a 183° arc and still maintain stability. The key to the speed of the operation is a specially-designed swivel bucket. Essentially a wide-opening pincer, the 21-cubic foot bucket can scoop up large piles of debris and, by means of the swivel action, put it into the truck without spillage. Controls that allow both free-fall and down pressure of the boom permit the operator to pack the trash into the trucks, thereby increasing their carrying capacity.

A high-level operator's seat, turned to face the rear of the tractor, gives the operator a 360-degree visual field. A folding canopy protects him from the sun and rain. Reversed transmission gears give the unit the appearance of moving backward when it is actually going forward.

Five truck drivers and five laborers formerly required one month to pick up lawn, tree and shrub trimmings from the five districts in Delray Beach. With the Trash-Master, a reduced crew covers each district in one day. One man works with the machine to load small pieces of trash, and two truck drivers deliver the loads to the disposal site. The tractor operator completes the trash pick-up crew.

City Hall as well as property owners notice the difference. Complaints about unsightly trash piles in front of the homes have dwindled to almost nothing. Delray streets are cleaner.

The large bucket folds against the machine in an open position when travelling from job to job.

MARK C. FLEMING
City Engineer
Delray Beach, Fla.

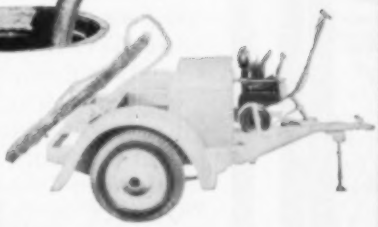
...what are your

Sewer Cleaning Problems?

Solve them all with POWERIZED O'Brien EQUIPMENT

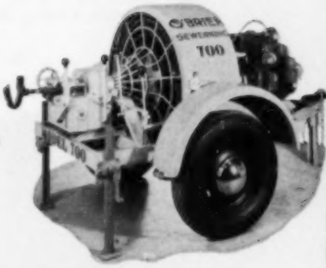
O'BRIEN
POWER RODDER
DEL 1000

O'Brien Power Rodder 1000



O'Brien Power Rod Drive

Bucket Machine and Dumper



Sewerking Cable Machines

O'Brien makes a complete line of sewer cleaning equipment. Every unit is the exact answer to a specific cleaning requirement and reflects O'Brien's long experience and familiarity with the field. Economy, efficiency, and convenience of operation are built into every piece of equipment.

O'Brien Power Rodder:

matchless driving and pull-back power, unexcelled for bucket threading and general sewer maintenance. 1200 ft. capacity can be used with either $5/16$ or $3/8$-inch rod. Equipped with automatic safety throw-out, positive rod drive, and footage meter.

Bucket Machine and Dumper:

featuring exclusive O'Brien hopper. Bucket dumps into hopper; after repeated bucket travel, full hopper is dumped into truck. Use of hopper eliminates truck and traffic tie-up during cleaning operation which relieves truck for many hours of other duties while hopper is being re-filled. 9 hp., 16 hp., and 25 hp. models available.

Sewerking Cable Machines:

compact, powerful, economical cable rodder. Ideal for removing roots, grease, sludge and general sewer waste. Four Sewerking cable models available with capacities from 250 to 600-feet.

O'BRIEN MFG. CORP.,
5634 Northwest Highway, Chicago 46
Send me full information on

☐ O'Brien Power Rodder ☐ O'Brien Cable Machines
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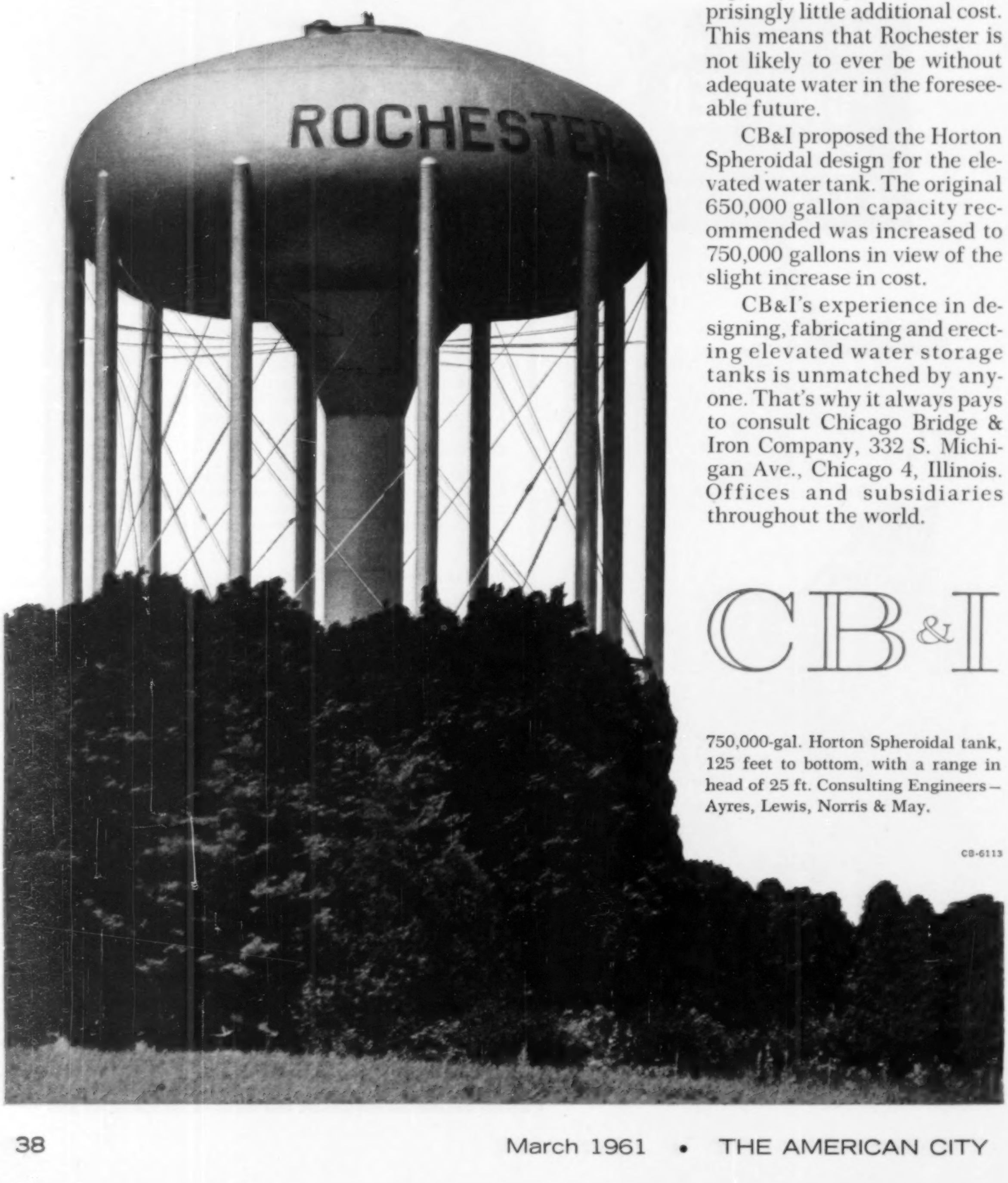


An Additional 100,000 Gallon Capacity ...A Bonus for Little Extra Cost

A 750,000 gallon elevated steel water tank for a village of 5,400 people may sound like a luxury. Actually it is, to the extent of 100,000 gallons excess capacity over present requirements. However, this extra capacity was provided at surprisingly little additional cost. This means that Rochester is not likely to ever be without adequate water in the foreseeable future.

CB&I proposed the Horton Spheroidal design for the elevated water tank. The original 650,000 gallon capacity recommended was increased to 750,000 gallons in view of the slight increase in cost.

CB&I's experience in designing, fabricating and erecting elevated water storage tanks is unmatched by anyone. That's why it always pays to consult Chicago Bridge & Iron Company, 332 S. Michigan Ave., Chicago 4, Illinois. Offices and subsidiaries throughout the world.

CB&I

750,000-gal. Horton Spheroidal tank, 125 feet to bottom, with a range in head of 25 ft. Consulting Engineers—Ayres, Lewis, Norris & May.

CB-6113

How Cities Spend Their Money

In 1959, the nation's municipal governments spent about three fifths of their total expenditures for current operations. This includes amounts for utility and insurance-trust purposes as well as general government purposes. Expenditures of this nature amounted to approximately $9,259 million, as against $8,763 million in the previous year.

Capital outlay made by cities, mostly for construction, but including spending for equipment and the purchase of land and existing structures, amounted to $3,653 million, or about one-fourth of all municipal expenditure. Payment of interest on debt, including utility as well as general municipal debt, amounted to $612 million. Expenditure for personal services was approximately $6,362 million or about 44% of all municipal expenditure. Personnel service costs are mainly for current operation, but include also some amounts for personnel engaged in construction work.

At the end of fiscal 1959, municipal indebtedness totaled $22,057 million or about 8% more than the debt of the previous year. This includes approximately $13,809 million of long-term indebtedness pledging the cities' full faith and credit; $7,142 million of non-guaranteed long-term debt, and some $1,107 million of short-term debt.

During the 1959 fiscal year, municipal governments issued approximately $2,714 million of long-term debt, including $666 million for utilities. During the same period they retired $1,267 million of long-term debt including $338 million of utility indebtedness.

The figures are part of a U. S. Department of Commerce report, "City Government Finances in 1959," prepared under Allen D. Manvel, Chief, Governments Division, Bureau of the Census. ◄◄

First Feminine Commissioner Of Public Utilities

Mrs. Donald M. DeCourcy is the first feminine commissioner of Public Utilities in the history of St. Paul, Minn. She began her political career after the death of her doctor-husband. Her first elective office was that of county commissioner, a position she held for five years until she resigned to become a member of the Saint Paul City Council. She was

(Continued on page 43)

Air Pollution Control News

Plant Killers

Fluorine, unburned hydrocarbons and ozone are the principal gaseous offenders in plant-life damage, according to Dr. Robert Daines of the Department of Plant Pathology of Rutgers University, the state university of New Jersey. Dr. Daines said such damage is particularly great in highly industrialized and densely populated areas, where the problem is sometimes widespread. While stressing air pollution's bad effect on plant life, Dr. Daines, by inference, indicated that the effect on human life is of even greater concern.

Detroit Automobile Study

Wayne State University in Detroit, Mich., is beginning a study of air pollution from automotive vehicles, in conjunction with the Michigan State Highway Department. Plans call for an overhead structure to be built on a heavily traveled Detroit street. Air ducts in the structure will suck in the air pollution from the vehicles which pass below. The samples will be analyzed at Wayne's university medical center laboratory, to determine the types and concentrations of the pollutants.

N. J. Permits "Economic Poisons"

The New Jersey Air Pollution Control Commission has adopted the sixth in a series of chapters of the New Jersey Air Pollution Control Code. The new chapter became effective on January 1st. Chapter VI supplements the specific and more detailed prohibitions already spelled out in previous chapters, according to William R. Bradley, Chairman of the Commission. It specifically excludes from regulation the discharge of what the Chapter calls "economic poisons," such as those chemicals used as insecticides, rodenticides, fungicides, herbicides, nematocides or defoliants, while prohibiting anyone from causing, suffering, allowing or permitting "to be emitted into the outdoor atmosphere substances in quantities which shall result in air pollution."

European Police Suffer

The World Health Organization, in a recent report on the state of health in Europe 15 years after World War II, had this to say (in part) about air pollution on the Continent: "Every large town and industrial area is threatened with air pollution. . . . The quantity of polluting matter breathed in by the inhabitants of most of Europe's large towns is frightening, all the more so because of the number of poisons and cancerogenic substances detected by chemical analysis. . . . In industrial areas it has been noted that the number of people killed by chronic bronchitis is three or four times higher than in other areas. The economic importance of air pollution is also far from negligible. Particles of matter suspended in the air cause corrosion and deterioration of metals, the erosion and blackening of stones, the destruction of trees, etc. To industrial waste matters must be added the exhaust gases of motor vehicles. The increasing density of automobiles constitutes a serious health hazard for the town dweller. Traffic policemen, whose exposure to exhaust fumes is particularly heavy, may suffer from a specific syndrome caused by these gases."

More Money Needed

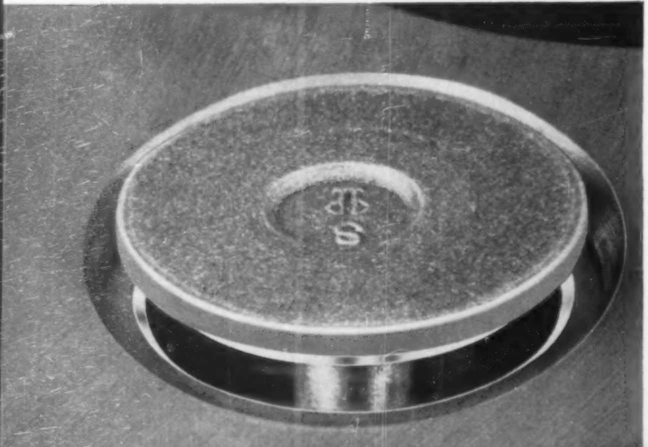
The need for more money for the Florida Air Pollution Commission is being made known to the 1961 session of the Florida Legislature. The Commission was reported ready to ask for a total of $224,740 on which to operate during the next two years. The additional funds represent an expansion of the Commission's activity, to include the industrial area around Pensacola.

—Prepared by Kenneth Kowald

Beefed up for hardest

Onan builds every plant as if a life depended on it. We never know the ultimate use of an Onan generator when it comes off the line, but before the Performance Certified tag is attached, we *do know* the plant could be depended upon in *any* emergency. Whether your need is for emergency lighting or electricity for an iron lung, why settle for second best? Before you buy any electric plant, see your local Onan distributor or dealer.

Stellite coated exhaust valves and valve seats. One of toughest alloys known. Gives you up to 300% longer valve life than uncoated valves. It's the important details like this that make Onan more economical in the long run.



Exacting standards govern manufacture—years of specialized experience and extensive testing facilities control the quality of Onan Power Plants. Over 1000 different types and sizes of plants are produced by Onan.

use...even abuse

Onan electric plant still delivers full power after 12,197 hour test—equal to 487,888 miles

A grueling endurance test that lasted one year, nine months and 12 days could not stop Onan test plant #1068. Onan engineers used this production-built unit for an endurance run—and after it was all over, it still generated the full rated power promised on the nameplate. Proof that Onan's exacting standards and production testing give you a power plant with long, dependable life built in.

Over 1,700 other endurance units have been run by Onan engineers. In these tests every design feature and part has to prove itself before it can become a part of the Onan you buy. In addition, every type and size Onan plant is tested under all operating conditions which could conceivably affect performance on your job.

Hours of running in and testing under full load are given *every* Onan before it is shipped. An independent testing laboratory then spot tests Onan Plants that have already been tested by Onan—double assurance that every Onan will deliver its full nameplate rating. Only then does an Onan production run qualify for Performance Certification.

Buy *proven performance* when you buy an Electric Plant. See your authorized Onan distributor or dealer. You can depend on him for a lifetime of factory parts and service. He's listed in the Yellow Pages.

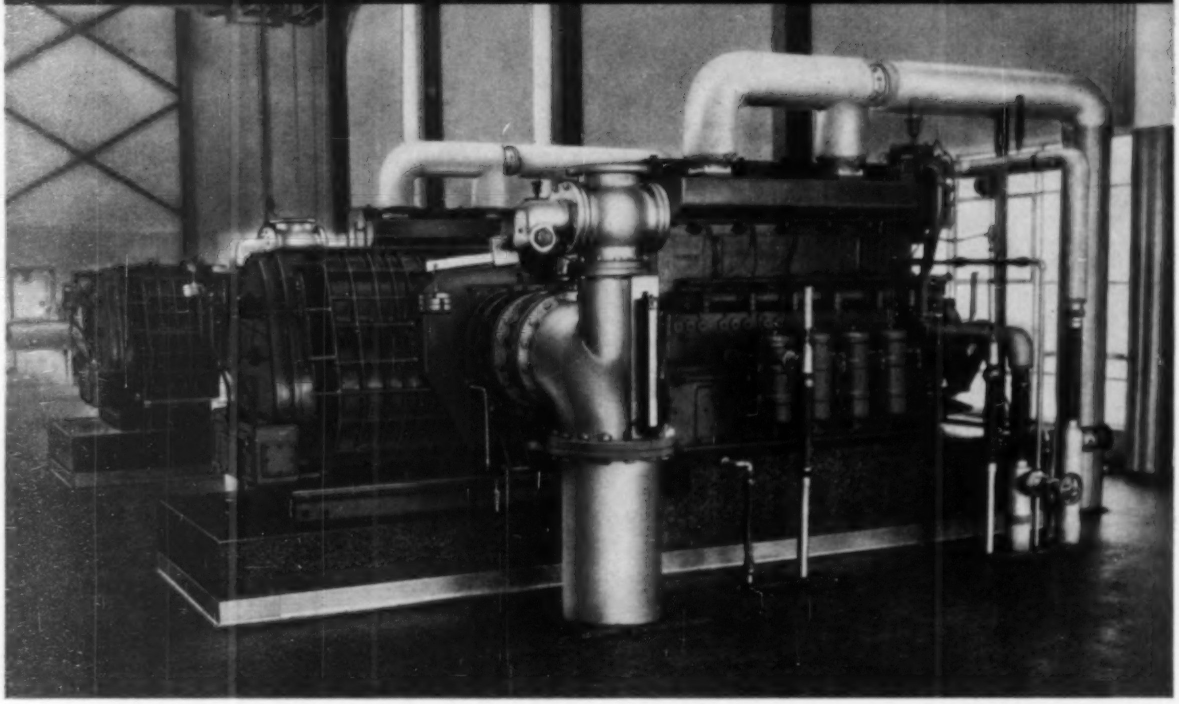
ONLY ONAN GIVES YOU THIS CERTIFICATION

PERFORMANCE CERTIFIED

We certify that when properly installed and operated this Onan electric plant will deliver the full power and the voltage and frequency regulation promised by its nameplate and published specifications. This plant has undergone several hours of running-in and testing under realistic load conditions, in accordance with procedures certified by an independent testing laboratory.

World's Leading Builder of Electric Power Plants

ONAN DIVISION, STUDEBAKER-PACKARD CORPORATION • 2613 UNIVERSITY AVE. S. E., MINNEAPOLIS 14, MINNESOTA



WHITE/SUPERIOR ENGINES OPERATE ON FREE SEWAGE GAS

at Hamilton, Ohio's 12,000,000 gallon per day sewage treatment plant

Two White Superior 6G-825 gas engines at Hamilton, Ohio's new activated sludge type sewage treatment plant are saving taxpayers thousands of dollars yearly. Engines operate on free sewage gas produced in the plant digesters. The Superiors, each rated 300 bhp at 690 rpm, drive blowers with a total capacity of 14,000 cfm to aerate sewage. Heat from engine cooling water also helps heat the buildings.

Superiors also feature outstanding design simplicity, with fewer moving parts than comparable power units. Maintenance and repair costs are minimized, and replacement parts are seldom needed, even after extremely long periods of operation.

White Superior covers every municipal power requirement with a complete line of dependable diesel, dual-fuel and gas engines, 190 to 2150 hp, or 150 to 1500 kw. *Write for literature today!* WHITE DIESEL ENGINE DIVISION, Springfield, Ohio.

White DIESEL | Superior ENGINES

White Diesel

(Continued from page 39)

the first woman in the State of Minnesota to be elected to serve on a board of county commissioners, and she is the first woman to serve on the Saint Paul City Council. She was elected to the City Council in 1956 and has been re-elected twice since then.

In 1960, Mrs. DeCourcy was appointed Commissioner of Public Utilities. She is *ex-officio* president of the Board of Water Commissioners and in general charge of the Saint Paul Water Department. In addition to that department, she has full charge of public street lighting, the municipal testing laboratory, the city market, public utilities building, the regulation of all public utilities within the city that are subject to regulation by the city and the abatement of air pollution.

Mrs. Donald M. DeCourcy

An association of male executives in the Twin Cities area selected Mrs. DeCourcy as one of twelve women to be recognized for their prowess in business and the professions. Also, she was one of a group of women chosen by the *Ladies Home Journal* to be given national recognition for accomplishment in politics. ◄◄

Municipal Bond Sales Stay Active

Sales of new issues of municipal bonds in the first ten months of 1960 continued at a high level, totaling over $6,220,000,000, announced Alan K. Browne, vice-president of the Bank of America, at the Municipal Forum which opened the annual convention of the Investment Bankers Association of America at the Hollywood Beach Hotel, Hollywood, Fla. These figures reflect a continuation of last year's trend, when sales of new issues set a new record for annual volume, aggregating over $7,600,000,000 in twelve months. ◄◄

TESTS PROVE:

NEW JOINTING MATERIAL LASTS LONGER THAN SUBSTITUTE PIPE

Lifetime Vitrified Clay Pipe—which is chemically inert and can't be damaged by gases and acids normally found in sewer lines—has been the standard of excellence for centuries.

But how about the new resilient jointing materials now being used on Clay Pipe? How do they stand up under acid attack?

Samples of standard jointing material have been suspended in sewer lines in cities all over the country to see how they react to normal exposure. But we wanted to find out quickly if they stand up to sulphuric acid—the number one killer of sanitary sewer lines built of substitute pipe.

In one test, samples of cement-asbestos, concrete and clay pipe and five jointing materials were weighed dry, then exposed to a five-percent sulphuric acid solution for 100 days. They were then removed from the acid, dried, and weighed again to observe weight loss and disintegration.

The results were amazing!

The sample of concrete pipe was completely disintegrated. The sample of cement-asbestos pipe was badly laminated and almost disintegrated.

But there was no evidence of any deterioration of either the jointing materials or, naturally, the Vitrified Clay Pipe.

Get all the facts* before you specify any kind of pipe for your community's sewer line. There's no substitute for lifetime Vitrified Clay Pipe with the new compression joints.

Pipe and jointing materials after 100 days exposure in 5% Sulphuric Acid Solution

before ↑
PIPE MATERIALS
after ↓
Cement-Asbestos
Concrete
Vitrified Clay

6 NEW JOINTING MATERIALS

before ↑
JOINTING MATERIALS
after ↓

before ↑
JOINTING MATERIALS
after ↓

Unretouched photographs made at the NCPMI Research Laboratory

**Further explanation of this experiment is available on request.*

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1028 Connecticut Ave., Washington, D. C.

Please send me full details on the new factory-made compression joints on Clay Pipe.

(name)

(company)

(street address)

(city and state)

8-2C23 AC

COMPRESSION SEALED, VITRIFIED CLAY IMPERVIOUS PIPE
THE STANDARD in SANITARY SEWERS

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1028 Connecticut Avenue Washington 6, D. C.

Have You Problems?

These Free Booklets Will Help You

Check over these listings which will provide you with important up-to-date information on equipment and services that will assist you in solving municipal problems.

Write to address given or circle corresponding number on free post card on page 51.

Dependable Power Plants

245 Planning purchase of an emergency electric generating plant? Why not ask a leading builder of electric power plants about points to consider when making a selection, items to evaluate? ONAN DIV., STUDEBAKER-PACKARD CORP., 2613 UNIVERSITY AVE. S. E. MINNEAPOLIS 14, MINN. will send information and give you facts on a really hardy line of equipment.

Diesel Engine Bulletin

246 . . . gives full facts on a light-weight, self-contained line of diesels—Yanmar, Series A-L—ideally suited for powering portable equipment, emergency pumps and generators. The 4-cycle, single cylinder units operate in the 2000-3000 rpm range, in the 2-4½-bhp range, and may be obtained in two sizes with either crankshaft or camshaft drive. Write CONTINENTAL MACHINERY CORP., P. O. BOX 19402 S. SUSANA RD., COMPTON, CALIF.

Increases Life of Every Paving Job

247 Technical information and complete specifications for the use of Rub-R-Road compounds, which contribute endurance to bituminous pavements, portland cement mixtures, playground surfacing, and seal coating, can be obtained from RUB-R-ROAD DIV., XYLOS RUBBER CO., AKRON 17, OHIO.

Incinerate Refuse and Sludge

248 Incinerating both refuse and sewage sludge at the same plant site does offer cities—large and small—numerous advantages in terms of savings in land, labor, fuel, capital investment, reports COMBUSTION ENGINEERING, 200 MADISON AVE., NEW YORK 16, N. Y., which can supply full facts on such a system.

Chemical and Slurry Feed Pumps

249 Just published, *Bulletin* No. KSP-4 describes and gives specifications on chemical and slurry feed pumps manufactured by KOMLINE-SANDERSON ENGINEERING CORP., PEAPACK, N. J.

Reduces Refuse Handling Costs

250 THE COBEY CORP., GALION, OHIO reports that its new Pak-Tainer system of refuse handling can reduce labor costs by as much as 96%, speed collection and cut capital investment substantially. Details available on request.

Save Up to 35%

251 A New Jersey town reports savings up to 35% in street sweeping operations through use of Prostran-Polypropylene street sweeping fibres. Full story and complete description of Prostran can be obtained from E. B. & A. C. WHITING CO., BURLINGTON, VT.

High-Speed Rotary Mowers

252 WOOD BROTHERS MFG. CO., 54103 S. 4TH ST., OREGON, ILL., specialists in the manufacture of tractor-powered rotary mower shredders, reports on its current line of rotaries, which offers a choice of swath widths from 3½ to 9½ feet, cuts quick and clean, leaves lawn smooth, even.

Is Your Aerial Lift Safely Insulated?

253 Here is a booklet on the applications and testing of proper dielectrics. Material covers electrical characteristics, high voltage proof tests, quality control and maintenance, electrical tests and other factors necessary to insure electrical safety in an aerial device. "The Proper Dielectrics of an Aerial Device" was prepared by ASPLUNDH CHIPPER CO., HAMILTON ST., CHALFONT, PA.

Type, Insert, Print

254 It's that easy, reports ACME VISIBLE RECORDS, INC., 8603 W. ALLVIEW DRIVE, CROZET, VA., and that time-saving when directories, catalogs, prices, parts lists and indexes are made the Photo Panel way.

When Does a Secret Remain a Secret?

255 According to a new catalog from INDUSTRIAL SHREDDER AND CUTTER CO., 122 MILL ST., SALEM, OHIO, when it's shredded into ¼-inch strips by an Auto-Shred, a compact, table-top unit that destroys in seconds, obsolete, confidential business papers, plans, records. Free trial offer available.

Versatility Unlimited

256 Here's a piece of equipment that really gets around—efficiently operating at the sanitary landfill, power-shoveling, dozing, producing surfacing material, doing "grader" work, loading. DROTT MFG. CO., MILWAUKEE 15, WIS. will provide details on the 4-in-1.

Cat's 922 Series A Traxcavator

257 Engineering details of this wheel loader which assure quick response performance, operator safety and convenience, greater ease of servicing and versatility in material handling work are described at length in *Booklet* No. 34004, just released by CATERPILLAR TRACTOR CO., PEORIA, ILL.

Self-Closing Waste Receptacle

258 This 2½-pound unit has an 11-gallon capacity. It's designed for locations where compactness is important, and it has a serviceable, polyethylene plastic inner container that can be washed clean. For catalog, write BENNETT MFG. CO., INC., DEPT. 67, ALDEN, N. Y.

Versatile Motor Graders

259 Grading, ditching, sloping, scarifying, bulldozing, snow plowing, maintaining shoulders, resurfacing — all-wheel steering, all-wheel drive Pacers do all, easily negotiating hairpin turns and up-grades. Ask AUSTIN-WESTERN CONSTRUCTION EQUIPMENT DIV., B-L-H, AURORA, ILL., about them.

Rugged Refuse Receptacles

260 Built to hold 5 bushels of trash, the Tarco refuse receptacles feature two vertical hanging self-closing doors, all-welded heavy-guage steel bodies. They're weatherproof and ideally suited for street and park use. Write TARRANT MFG. CO., 23 JUMEL ST., SARATOGA SPRINGS, N. Y.

Insecticide Fog Applicator

261 . . . for area control of mosquito and other insect pests is one-man operated, has only one moving part. A 4-page bulletin describes the "See-Fog" as much lighter in weight, more compact, less expensive than other applicators of comparable capacity. Write DEPT. A, SEE/FOG DIV., THE SEEBURG SALES CORP., 1500 N. DAYTON ST., CHICAGO 22, ILL.

How to Get Better Street Trees

262 THE COLE NURSERY CO., PAINESVILLE, OHIO, which has concentrated on developing and producing better varieties and quality trees, shrubs and evergreens for more than 75 years, can help you with this problem as well as with your maintenance and landscaping problems.

Cuts Through Earth Formations

263 A low-cost way to drill holes under lawns, highways, streets and walks without trenching and tearing up pavement is explained in a new catalog offered by CONSTRUCTION MACHINERY CO., WATERLOO, IA., manufacturer of a new Wonder horizontal earth drill.

Power Packs Refuse

264 For Hammond, Ind., this means getting 3 times the load and a savings of 2 hours per day in dump travel time. The color movie "Power Packing" and complete literature on Daybrook Power Packers will supply the facts. Write EQUIPMENT DIV., YOUNG SPRING & WIRE CORP., BOWLING GREEN, OHIO.

Incandescent and Mercury Vapor Lamps

265 These lamps are weather-proof, have lasting brilliancy, and are said to be less expensive in any regular replacement program. RADIANT LAMP CORP., 300 JELLIFF AVE., NEWARK, N. J., describes their use in building, athletic field, and airport lighting systems.

Asphalt Roller-Soil Compactor

266 This self-propelled vibratory unit moves from job to job on any truck tailgate, achieves high production on asphalt and granular materials. It rolls flush with curb and is well suited for patch work. Ask VIBRO-PLUS PRODUCTS, INC., STANHOPE, N. J., for literature on the CL-12.

Wrap, Squeeze, and Pop!

267 That's all it takes to cut through cast iron water main 10 inches through 20 inches in diameter, when the new "Super" hydraulic Model 5590 pipe cutter is on the job. No accessory equipment is required. For catalog, write THE WHEELER MFG. CORP., P. O. BOX 688, ASHTABULA, OHIO.

Pocket-Size 2-Way Radio

268 Municipalities will find numerous uses for this new transistorized 2-way radio with rechargeable battery and ½- to 1-mile range. For complete information on Pocketphone, write GLOBE ELECTRONICS, a division of TEXTRON ELECTRONICS, INC., 22-30 S. 34TH ST., COUNCIL BLUFFS, IND.

(See page 50 for more Bulletins)

EAGLE monotrol® system

saves 60% in wiring costs alone *at Columbus, Ohio*

CITY OF COLUMBUS OHIO

In the Words of — **Albert G. Giles** Director of Public Safety City of Columbus and **John L. Gallagher** Chief Traffic Engineer City of Columbus

Eagle "Monotrol" Central Office Master Control Panels

Eagle EF-20 Local Multi-Dial Controllers

"In December, 1960, Columbus, Ohio, completed a comprehensive three-year traffic modernization program. We now have four complete Eagle Monotrol Multi-dial Systems, totaling 298 signalized intersections of the city's 480."

"Each of the four systems is interconnected by Monotrol providing *thirty-one functions over a single pair of wires,* saving us 60% in wiring costs alone, which is, of course, of basic concern to all Municipal purchasing. Further economies will be realized in the future because the extremely flexible system will not require costly, complex replacements and alterations. Although we are using only nine functions at present, many more will be added. Without these available spare functions, future growth of the system would be virtually impossible.

"It is too early to quote statistics on these recently installed systems, but they have definitely speeded up the flow of traffic through our city and we fully expect a concurrent drop in our accident rates.

"The components have not presented any maintenance problems over the three-year installation period, other than routine matters, such as cleaning contacts and lubrication once a year."

INVESTIGATE AND SPECIFY EAGLE MONOTROL® SYSTEMS for Traffic Control flexibility, expansibility and built-in savings. . at time of installation. .and in the future.

EAGLE SIGNAL
Moline, Illinois

A DIVISION OF THE GAMEWELL COMPANY, AN E. W. BLISS COMPANY SUBSIDIARY

Eagle Equipment Saves Lives — Saves Time

EAGLE SIGNAL COMPANY, Municipal Division
Dept. AC-361, MOLINE, ILLINOIS

Please send me more information on your Monotrol and Multi-dial Controllers as used in Columbus, Ohio installation.

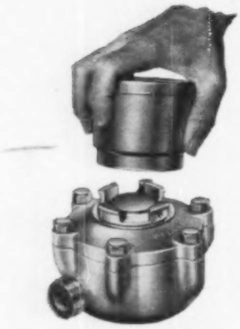
NAME AND TITLE

ORGANIZATION

FULL ADDRESS

NOW THE FIRST MAGNETIC DRIVE

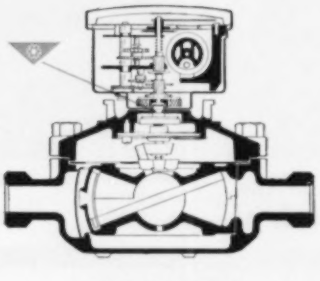
Only the Badger *Easy-Read** offers . . .



REMOVABLE REGISTER

999933 0
GALLONS
BADGER METER MFG. CO.
MILWAUKEE, WIS. U.S.A.

BOLD NEW FACE



SAPPHIRE JEWEL BEARING

Magnetic drive is even bigger news in Badger's Easy-Read water meter, where it combines with the long-accepted superiority of disc meter performance.

The new Easy-Read has no troublesome stuffing box, no consequent drags or leaks. It's sealed tight against water, dirt, fogging, tampering and corrosion.

But *only* the Easy-Read provides these: a low-friction, self-cleaning sapphire jewel bearing that acts as a buffer for the magnetic coupling . . . a new exclusive removable register . . . the largest, most readable face (its digits 1/4" tall) of any meter.

Plus interchangeability of parts—permitting you to modernize your present Badger meters just by replacing certain parts.

Easy-Read meters are made in 5/8", 5/8" x 3/4", 3/4" and 1" sizes in split case and frost-proof models. Also 1½" and 2" sizes in split case type. *Shown at right:* 5/8" x 3/4" split case and (smaller illustration) 5/8" x 3/4" frost-proof Easy-Read meters.

Ask your Badger representative for complete details. Or write to the address below for new, 4-page Easy-Read bulletin.

*Patent applied for

Split case Easy-Read meters

¾"

1"

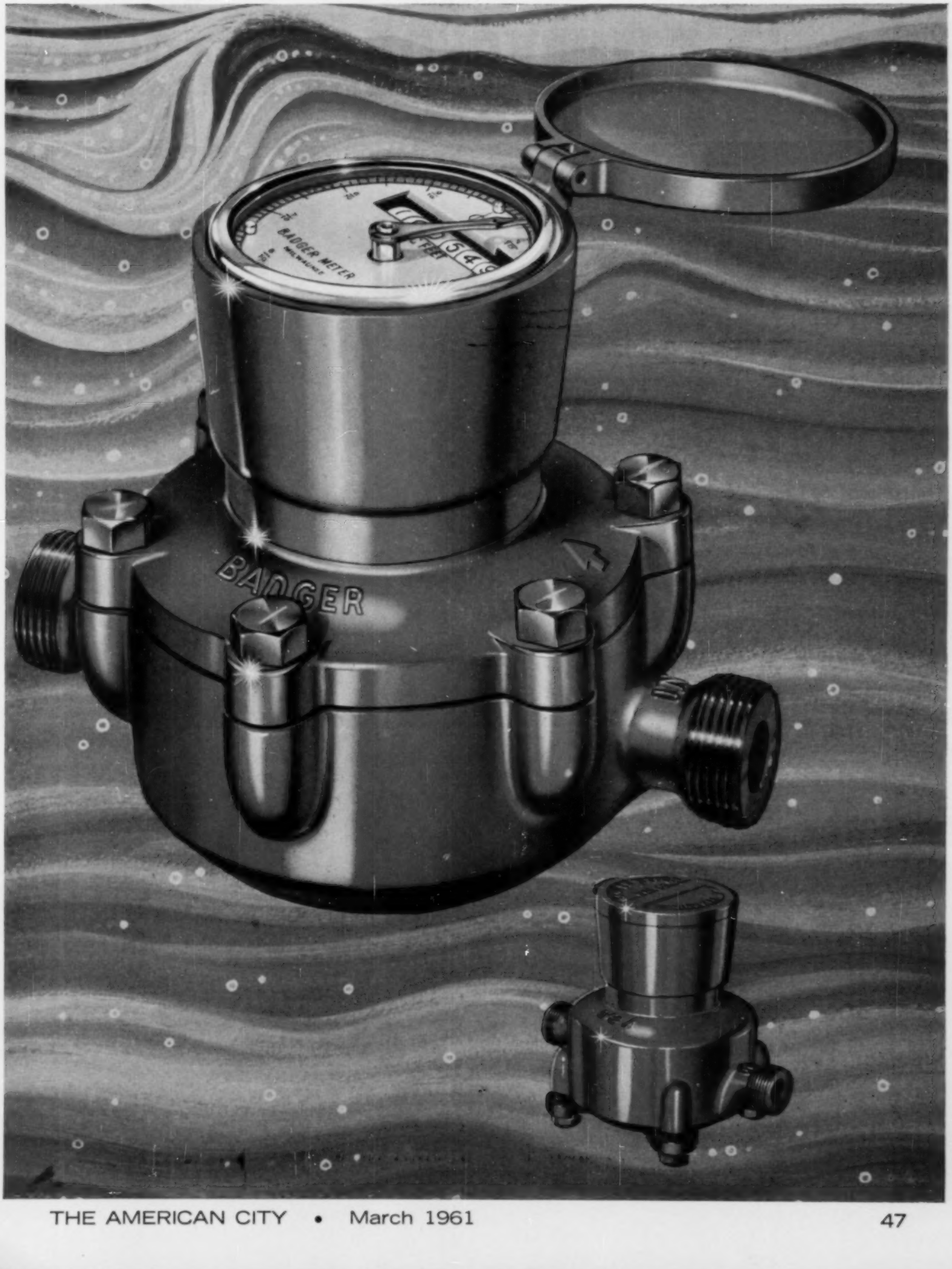
1½"

2"

Badger Meter Mfg. Company

4545 West Brown Deer Road • Milwaukee 23, Wisconsin

METER WITH A DISC METER CHAMBER


BADGER METER
MILWAUKEE
CUBIC FEET
BADGER

TRAXCAVATORS...fast...safe... ALWAYS READY TO GO

CATERPILLAR

CATERPILLAR

easy to operate
WHEN YOU NEED 'EM

The town of Canaan, New York, and the township use this 955 Traxcavator to widen gravel roads, load gravel and plow snow. The operator says this 955 is three times better than previous machine. Power shift transmission speeds operation. Lifetime lubricated rollers and dry-type engine air cleaner cut maintenance time.

3 TRACK-TYPE TRAXCAVATORS

933–1⅛ YD. STD. BUCKET–52 HP (flywheel) Cat Diesel Engine–direct drive transmission with Cat exclusive oil clutch.

955–1¾ YD. STD. BUCKET–100 HP (flywheel) Cat Diesel Engine, turbocharged for efficiency–single lever control power shift transmission.

977–2½ YD. STD. BUCKET–150 HP (flywheel) Cat Diesel Engine, turbocharged for efficiency–single lever control power shift transmission.

Franklin Township Road Dept., Murrysville, Pa., uses this 944 Traxcavator summer and fall for widening, repairing and building roads . . . plowing, cindering and keeping roads open in winter. To get equipment that's ready to go when they need it, Franklin Township purchases on a best buy basis, not necessarily on low bid.

3 WHEEL-TYPE TRAXCAVATORS

922–1¼ YD. STD. BUCKET–80 HP (flywheel) Cat Diesel Engine, turbocharged for efficiency (gasoline engine also available)–Cat power shift transmission–four forward speeds–four reverse speeds.

944–2 YD. STD. BUCKET–105 HP (flywheel) Cat Diesel Engine, turbocharged for efficiency (gasoline engine also available)–Cat power shift transmission–four forward speeds–four reverse speeds.

966–2¾ YD. STD. BUCKET–140 HP (flywheel) Cat Diesel Engine, turbocharged for efficiency–Cat power shift transmission–four forward speeds–four reverse speeds.

The unpleasant truth is . . . you can use up more of your budget maintaining an undependable machine than you spend on the loader that's always ready to do your jobs.

Your own records will show Traxcavators' unmatched dependability. Cities and counties, contractors and industrial companies have recorded operating costs and machine service hours that unquestionably prove that you can get more work out of Traxcavators than other loaders. Traxcavators are built better. And the Caterpillar Dealer keeps a full inventory of parts so that when your loader does need a quick repair you get fast service . . . constant availability.

And you get more than availability . . . you get the easiest operating, *fastest* loaders on the market. With power shift transmissions, automatic controls, Traxcavators make good operators even better in a hurry.

And when you need high production–need to load or feed 4000-5000 tons of material a day–look to the big 977 track-type or 966 wheel Traxcavators.

All your work, the tough stuff, the easy jobs . . . they're all handled faster and easier with a Traxcavator. Call your Caterpillar Dealer . . . do business with the man whose business is built on dependability.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

THESE FEATURES MAKE GOOD OPERATORS EVEN BETTER

SAFETY Lift arms and cylinders are all forward of the operator, give him complete freedom of movement; good visibility and automatic bucket positioners help him get top performance from the machine. Heavy frame and the design geometry give excellent stability.

LIVE-ACTION HYDRAULIC SYSTEM Plenty of power is always available to the big hydraulic cylinders to give fast and powerful bucket action. Control valves are enclosed in reservoir and system is full-flow filtered for protection from dirt.

POWER SHIFT TRANSMISSIONS Fast, effortless power shifting in first and second speeds, forward-reverse gives 25-second cycles to make each operation faster and easier. (On all but the 933 track-type loader.) Wheel loaders have 4-wheel drive for work, 2-wheel drive for travel.

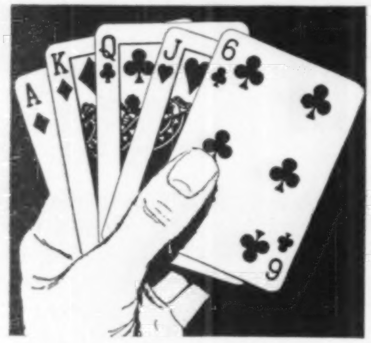
SIDE DUMP BUCKET Interchangeable with the standard bucket, exclusive Cat side dump bucket eliminates turning, requires less loading space . . . dumps to left or forward. Lift forks, special material buckets and other attachments are available to make your Traxcavator more versatile the year 'round.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

TRAXCAVATORS ARE MAKING OTHER LOADERS OBSOLETE

POKER? Play to win!



How would you play this hand?

Don't let the high cards tempt you. This is no better than drawing to an inside straight (odds about 12 to 1 against filling). Fold...fast...and patiently wait for a good hand.

Here's a sure winner from FORD:

Ford pays half your fuel bills for a full six months (or 400 tractor hours) on the purchase of any new Ford or Fordson diesel tractor.

This offer, made possible by the amazing fuel-saving performance of these low-priced diesel tractors, expires March 31, 1961.

No "hidden" price increase... no tricks of any kind. See your Ford Tractor Dealer for all the money-saving details!

Tractor and Implement Division,
Ford Motor Company,
Birmingham, Michigan

Ford
TRACTORS
EQUIPMENT

Your City Can Improve Services and Reduce Costs

...by taking advantage of the improved municipal equipment offered below.

Write to address given or circle corresponding number on free post card on page 51.

American Welded Wire Fabric for Concrete Reinforcement

269 . . . is the title of a hard-cover, 178-page illustrated book that will tell you just about everything you might want to know about welded wire fabric and its uses in all phases of concrete construction. Write AMERICAN STEEL & WIRE, 614 SUPERIOR AVE., N. W., CLEVELAND 13, OHIO.

Conditioning Roads?

270 You'll find the "Handy" spreader a handy piece of equipment at the job site. Available in 6 sizes, it spreads aggregate from a powder-fine carpet to 3 inches in depth. Illustrated brochure gives details. Write GOOD ROADS MACHINERY CORP., MINERVA, OHIO.

Weather-Resistant Fencing

271 Not only does this fencing material protect municipal property, it resists weather and corrosion, minimizing maintenance. For information on galvanized steel Realock Fence, write THE COLORADO FUEL & IRON CORP., BUFFALO, N. Y.; DENVER, COLO.; OAKLAND, CALIF.

A New Voting Machine

272 Election officials will be interested to learn about this new, small, lightweight, portable voting machine, which features a vertical ballot arrangement, is easy to store and use and simple to tabulate. SEISCOR MFG. CO., DEPT. AC-3, BOX 1590, TULSA, OKLA., can tell you the details.

Spring Tree Care

273 . . . should begin *before* leaves unfold, particularly in the case of Dutch elm disease control programs, reports DAVEY TREE EXPERT CO., KENT 16, OHIO, which can tell you about a complete tree-saving service, plus weed and brush control for communities of every size.

Concrete Steel-Cylinder Force Mains

274 PRICE BROTHERS, E. MONUMENT AVE., DAYTON, OHIO, will, upon request, send information that describes the advantages of using prestressed concrete steel-cylinder pipe for water distribution services. Life, maintenance, capacity, strength, etc. are covered.

Swimming Pool Chlorinators and Flowmeters

275 *Bulletin* 90-49-08 gives a concise description of the gas chlorinators, hypo-chlorinators, and flowmeters which comprise the complete swimming pool products line of FISCHER & PORTER CO., 761 JACKSONVILLE RD., WARMINSTER, PA. Features and capacities are shown; also listed are more comprehensive bulletins available on each product.

Cities and Counties

276 . . . will find the tractor-drawn TD-100 an ideal unit for spreading chemicals for ice control as well as fertilizer on parks, golf courses and roadsides. Spread pattern is 24-30 feet in width; application is constant regardless of tractor speed. For full facts, write HENDERSON MFG. CO., P. O. BOX 50, MANCHESTER, IA.

The Truth About Office Copying Machines

277 This booklet tells what to look for when considering purchase of an office copying machine. It discusses different copy processes, versatility, ease of operation and maintenance, cost of reproducing copies, speed of copying, etc. Write COPEASE CORP., 425 PARK AVE., NEW YORK 22, N. Y.

Turf Aerators That Don't Throw Up Soil Plugs

278 RYAN LANDSCAPE EQUIPMENT CO., 871 EDGERTON ST., ST. PAUL 1, MINN., reports that its 1961 Renovaires are the first to offer true-contour aeration of turf and all-season aeration that doesn't interfere with golf and other sports activities. Literature available on request.

Manual for Microbiological Analysis of Water

279 A 20-page illustrated laboratory manual prepared by the MILLIPORE FILTER CORP., BEDFORD, MASS., outlines the advantages inherent in membrane filter technique and procedures for using it in the bacteriological analysis of water. Also included are staining techniques and the biologic examination of water samples.

Fully-Motorized Telescoping Sludge Valve

280 AMERICAN WELL WORKS, AURORA, ILL., reports on its all-new MO-TEL-VALVE, a fully-motorized telescoping sludge valve designed to save man-hours and utilizing a valve control suitable for either single or 3-phase operation. Available in several sizes, standard units provide 4-foot travel.

Remote Controls for Outdoor Lighting Circuits

281 Switches and relays for the control of series or multiple circuits for street lighting, athletic field lighting, airport lighting are subjects about which SOUTH BEND CURRENT CONTROLLER CO., INC., 1237 N. SIDE BLVD., SOUTH BEND 15, IND. is very knowledgeable. So, if you've a problem, why not ask South Bend?

Loader-Tractor-Backhoe

282 A 4-page illustrated folder on the new and completely integrated Dynahoe loader-tractor-backhoe includes listings of special Dynahoe features, specifications and dimensions. For a copy, write THE HY-DYNAMIC CO., LAKE BLUFF, ILL.

Rotary Mowers

283 Tough, rugged performers, these rotary cutters are also versatile. They mow, shred, mulch and clear dense undergrowth. Catalog literature, available from LILLISTON IMPLEMENT CO., ALBANY, GA., gives full facts.

Loads Snow Fast

284 A rotary type of snow remover, designed for mounting on heavy trucks of the all-wheel drive type, is said to be able to fill the largest truck in 10 to 20 seconds. It is called SnoGo and is built for continuous operation. KLAUER MFG. CO., DUBUQUE, IA., will supply descriptive literature.

Air Compressor Bulletin

285 Portable, compact, rugged, powerful radial air compressors, sized right for the job, easy to maintain and operate are the subject of an illustrated bulletin, available from P. K. LINDSAY CO., INC., EVERETT 49, MASS.

Layne Fire Pumps

286 *Bulletin* 401 shows cross section drawings, typical installations, size and capacity charts, and detailed advantages of a Layne Vertical Fire Pump. Both oil and water lubricated types are shown complete with accessories. For copy, write LAYNE & BOWLER, INC., DEPT. AD, MEMPHIS 8, TENN.

(See page 55 for more Bulletins)

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WHAT'S BUGGIN' YOU, MAN?

If you need information on any type of municipal service or equipment, these reply cards will get action in a hurry.

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Save time and effort by using these reply cards when you want additional information on any product or service mentioned or advertised in this issue.

"suspects in custody... 10...30"

This arrest would not have been made if the officer covering the rear hadn't radioed the fact that the suspects were escaping thru a side entrance—out of his range, and out of sight of his partner in front.

This kind of teamwork is possible only when all officers are in constant radio contact—the men on foot as well as the men on wheels.

With Motorola portable equipment—"Handie-Talkie" radiophones and VHF pocket radios—no man is alone. Now every man can communicate with every other man—and have **complete, constant control** of every situation.

The new Motorola Pocket Radio is now completely transistorized. Used as a "sub-system" between officers on an assignment, and as an extension of your present mobile system, Motorola portables give you the ultimate in **teamwork** and **control** so vital to your efficiency—and to minimizing risks.

There's so much that's new about Motorola 2-way radio—mobile, portable and pocket radio—you'll want all the up-to-date facts.

Write today for complete descriptive literature—or call your local Motorola representative.

MOTOROLA 2-WAY POCKET RADIO
MOTOROLA MOTRAC 2-WAY RADIO
MOTOROLA Handie-Talkie

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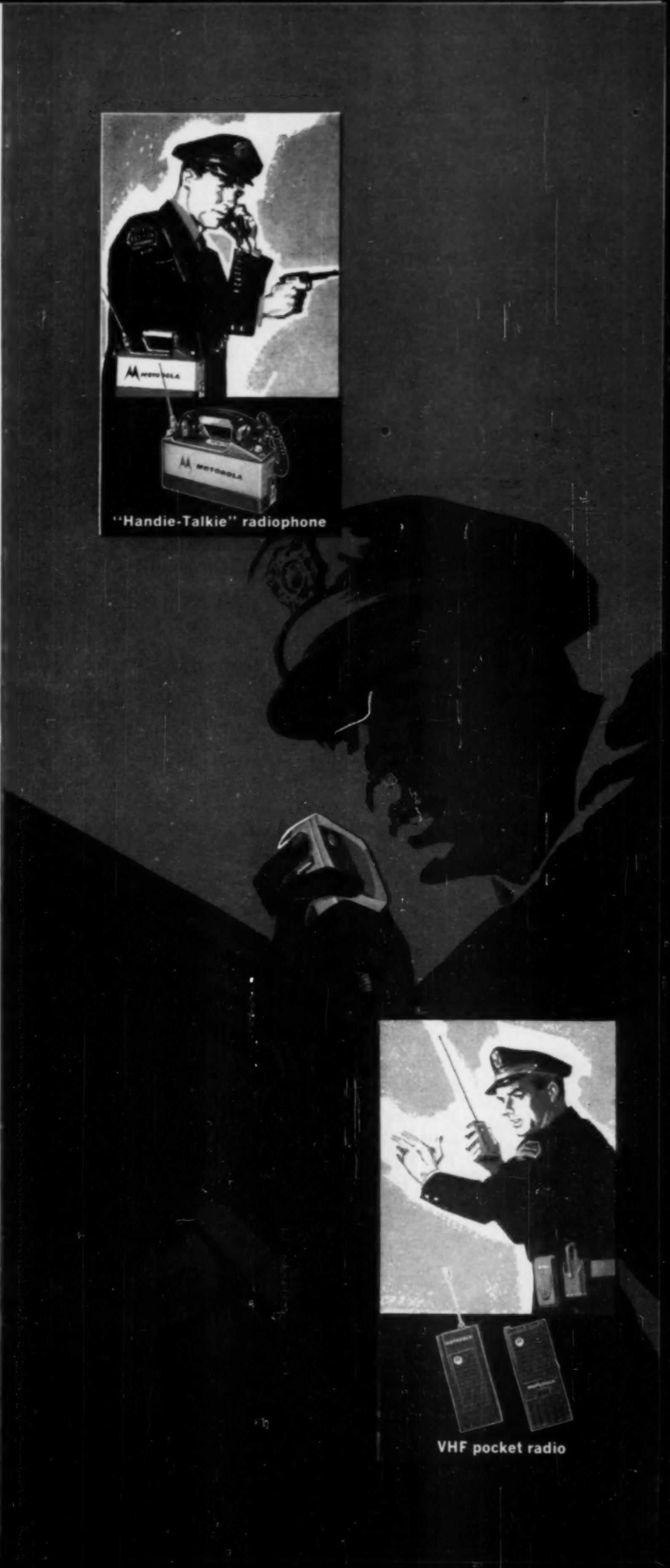
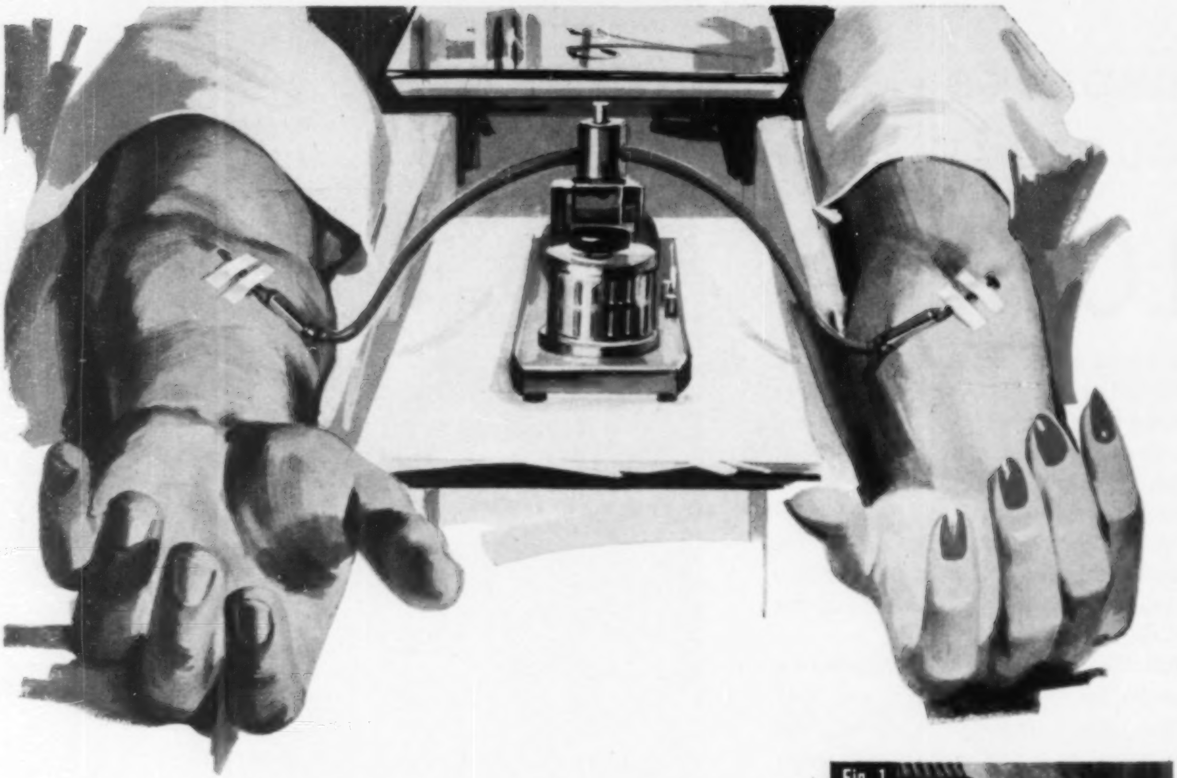
MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.
A SUBSIDIARY OF MOTOROLA INC.
4501 AUGUSTA BLVD., CHICAGO 51, ILLINOIS
"Handie-Talkie" is a trademark of Motorola Inc.



"Handie-Talkie" radiophone

VHF pocket radio



When a lifeline is tapped...

Tapping lifelines under pressure has become a vital technique for sustaining life and growth, whether it be a human circulatory system or a community water supply.

The method of tapping Lock Joint Concrete Pressure Pipe has been developed to a high degree of ease and efficiency. Of the thousands of taps made in various designs and sizes of this pipe, all have been effected with absolutely no damage to the structure of the pipeline.

Whether the job calls for a cross connection for a 150″ aqueduct (fig. 1), a 42″ outlet in a 60″ transmission main (fig. 2), or a ¾″ service connection in a 20″ transmission main (fig. 3), Lock Joint Concrete Pressure Pipe may be tapped economically and with complete assurance.

Fig. 1

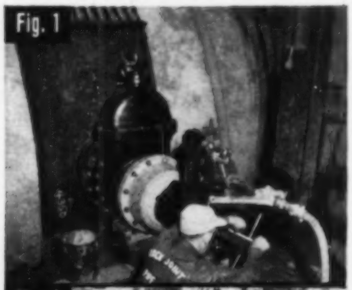


Fig. 2

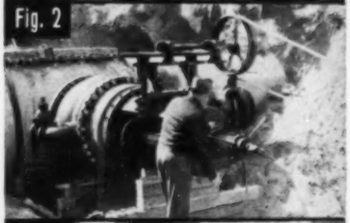
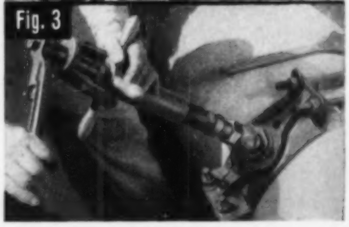


Fig. 3



LOCK JOINT
MADE ITS WAY
IN THE WAY ITS MADE
CONCRETE PIPE

LOCK JOINT PIPE CO.

East Orange, New Jersey

Member of the AMERICAN CONCRETE PRESSURE PIPE ASSOCIATION

Sales Offices: Chicago, Ill. • Columbia, S. C. • Denver, Col. • Detroit, Mich. • Hartford, Conn. • Kansas City, Kan. • Perryman, Md. • St. Paul, Minn. • Winter Park, Fla.

Pressure • Water • Sewer • REINFORCED CONCRETE PIPE • Culvert • Subaqueous

FREE catalogs

Write to address given or circle corresponding number on free post card on page 51.

3 Water Pump Bulletins

287 *Bulletin* B-1100A discusses dewatering pumps which pump water containing up to 20% solids; *Bulletins* B-1400 and B259, a complete range of high capacity, high efficiency submersibles for water supply applications. All three available from SUMO PUMPS, INC., BROWN HOUSE ROAD, STAMFORD, CONN.

New Outdoor Lighting Catalog

288 *Catalog* S-61, just issued by STONCO ELECTRIC PRODUCTS CO., 333 MONROE AVE., KENILWORTH, N. J., condenses a good general cross-section of their complete line of cast aluminum outdoor floodlights and fixtures into eight pages. Included are illustrations, specifications and dimensional drawings.

Water Works Engineers

289 A 4-page brochure and a 5-page specification booklet supply pertinent data on Durmanit asbestos-cement pressure pipe with the REKA coupling for water systems. Classes, sizes, crushing strengths, flow characteristics, service connections, etc. are given. Write AMERICAN MANNEX CORP., 680 FIFTH AVE., NEW YORK 19, N. Y.

Rotary Gang Mower

290 Trim, mow, mulch—in one operation; cut a swatch 70 inches wide; change cutting width while you mow; mow slopes as steep at 30%. The Clean-Cut 70 does this and more. For full-fact literature, write GRAVELY CLEAN-CUT MOWERS, P. O. BOX 736B, DUNBAR, W. VA.

Hazard Warning Equipment

291 Effective, durable, convenient-to-use street and highway hazard warning equipment are the subject of literature being offered by THE TOLEDO PRESSED STEEL CO., 397 PHILLIPS AVE., TOLEDO 12, OHIO. Kerosene signal torches, electric flashers and folding steel barricades are included.

Street and Traffic Signs

292 Have you seen the current catalog of the MUNICIPAL STREET SIGN CO., INC., 128-20 14TH AVE., COLLEGE POINT, LONG ISLAND, N. Y.? It will bring you up to date on a complete line of municipal signs, blanks, accessories hardware, posts and bases, their specifications and prices.

Pipe Coating Materials

293 These materials will help you combat corrosion. They include pipeline primers and enamels, asbestos pipeline felts and fabrics, and service cement. Detailed information can be obtained from the PLASTICS DIVISION, ALLIED CHEMICAL, 40 RECTOR ST., NEW YORK 6, N. Y.

Iron Removal Filters

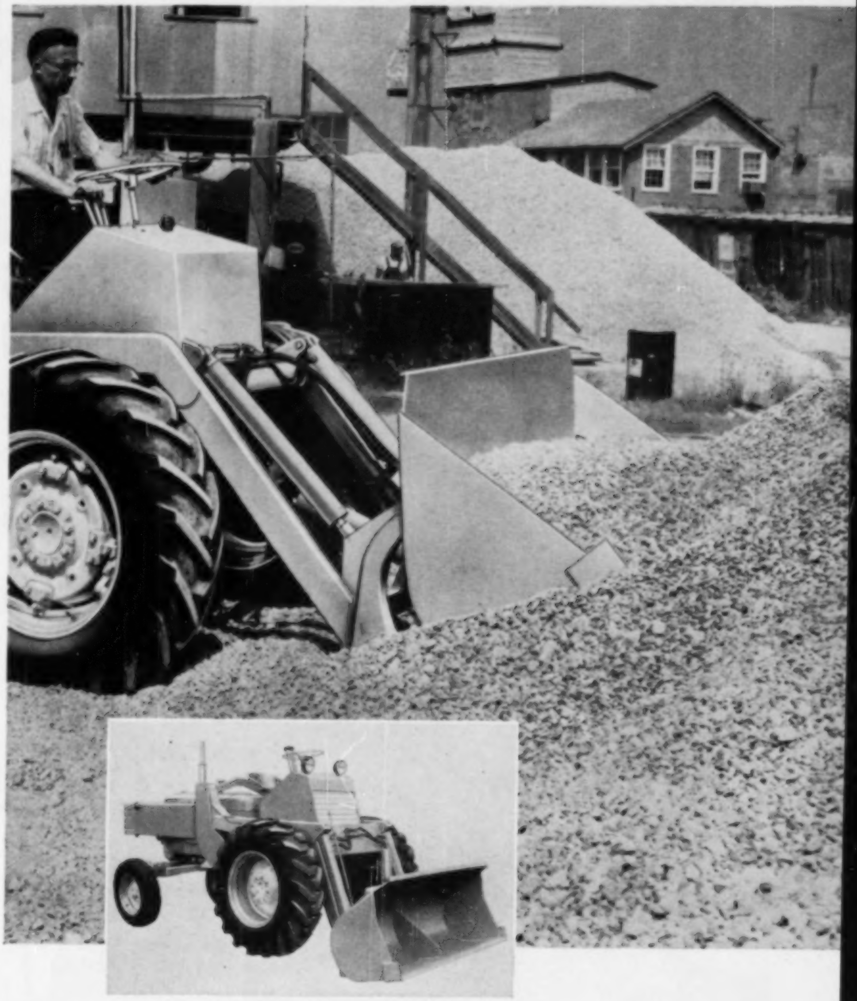
294 The several types of iron removal filters covered in *Bulletin* B-5916 are built by GENERAL FILTER CO., BOX 350, 925 2ND ST., AMES, IA. They include presure, gravity and contact filters.

Easier Water Meter Servicing

296 Servicing and changing of in-line water meters are made less difficult by a handwheel operated expansion connection on Ford straight line yokes, reports THE FORD METER BOX CO., INC., WABASH, IND. For details and complete information on models, write the company.

(See page 56 for more Bulletins)

BIG WHEELS UNDER THE LOAD!



FOR the surprise of your life, watch this Allis-Chalmers D-15 Utility tractor handle a full 1-yard loader bucket! There's greater breakout and lifting capacity because weight of the unit, material and bucket are applied against the *big* wheels! The operator sits high, close to the work where he can see what goes on!

The exclusive self-loading bucket hydraulically rolls up into the material for a heap load on every pass. Then the **SHUTTLE clutch** lets you move out and away fast, without foot-clutching or gear-shifting.

IT DOESN'T COST TO FIND OUT why Allis-Chalmers Utility tractors pay off for profit-minded contractors! See your Allis-Chalmers dealer today, or write Allis-Chalmers Mfg. Co., Utility Tractors and Equipment, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

CATALOGS *for Improved Municipal Services*

Write to address given or circle corresponding number on free post card on page 51.

Digs Straight, Backfills Quickly

297 The new Model C T-66 trencher-backfiller, introduced by DAVIS MFG. INC., 1500 S. McLEAN BLVD., WICHITA 13, KANS., handles a broad scope of assignments. Its digging range is from 12 inches in width, 30 inches in depth to 3 and 4 inches in width, 66 inches in depth and at widths and depths in between.

Pipe Flow Recording

298 . . . explained in a way that you can understand is what you get in the new 8-page bulletin about Chronoflo Telemetering equipment and systems. It gives the basics of transmitter and receiver operation in a time-duration impulse system, a brief description of differential producers, and applications listing. For *Reference* No. 230.20-2, write B-I-F INDUSTRIES, INC., 345 HARRIS AVE., PROVIDENCE, R. I.

New Kind of Diesel Work Power

299 ALLIS-CHALMERS MFG. CO., ENGINE-MATERIAL HANDLING DIV., MILWAUKEE, WIS. features its Models 10000 and 11000 diesel engines in *Catalog* BU-718. Performance curves and charts, illustrations, and cutaways of important components help to explain these new engines in the 100-210 hp class.

Fire-Fighting Equipment

300 Pumping engines (500, 750, 1000 gallons), aerial ladder trucks (65, 75, 85 feet), custom pumpers (500, 750, 1000, 1250 and 1500 gpm sizes)—reliable fire apparatus built to meet specific requirements — are subjects of literature available from PETER PIRSCH & SONS CO., KENOSHA, WIS.

Compact Lawn, Garden Tractor

301 A 7-hp Cub Cadet with attachments for mowing, lawn sweeping, seeding, fertilizing, raking, rolling, earthmoving, snow plowing, hauling and clearing, represents entry into the compact lawn and garden tractor field by INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

Fertilizer Spreader

302 The new Milorganite spreader covers a lawn 5 times faster than is possible with conventional spreaders, reports THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, WIS. It also frees lawns from fertilizer streaks.

Sanitation and Fly Control

303 This 12-page booklet, published by LETHALAIRE DIV., VIRGINIA SMELTING CO., WEST NORFOLK, VA., points out why flies are a serious problem, lists some general rules of sanitation, discusses Lethalaire method of fly control, notes some basic rules of sanitation and fly control.

Drive Up, Hitch Up

304 A quick-snap coupling enables you to drive up to a snow plow, hitch plow and truck in seconds, and get underway without ever leaving the cab. KASTEN MFG. CORP., ALLENTON, WIS., says the secret's in the spring pin action; a new bulletin will give you the details.

Water Plant Superintendents

305 GRAVER WATER CONDITIONING CO., MUNICIPAL DEPT. M-433, 216 W. 14TH ST., NEW YORK 11, N. Y., describes the distinctive features of a cold process water softener and clarifier in *Bulletin* WC-113A and in several technical articles.

For All That's Electrical

306 Street lighting, good lighting, traffic signals, horns, sirens, communications equipment, CD requirements, portable emergency lighting units—facts and figures on over 100,000 electrical items are available from GRAYBAR ELECTRIC CO., INC., 420 LEXINGTON AVE., NEW YORK 17, N. Y.

Street Construction Men

307 THE HELTZEL STEEL FORM & IRON CO., WARREN, OHIO, has published several bulletins that will be of interest and value. They deal with forms for curb, curb and gutters, sidewalks, driveways and highways, plus tools, straight edges, storage bins and finishing machines.

Concrete Gunning Equipment

308 This catalog could suggest a faster, easier, more profitable method of handling concrete maintenance and restoration. It tells all about the Airplaco line of concrete gunning and placement equipment and its applications. Write AIR PLACEMENT EQUIPMENT CO., 1005A W. 25TH ST., KANSAS CITY 8, KANS.

Worried About Dutch Elm Blight

309 . . . and other insect pests and parasites? Then you'll want to write JOHN BEAN DIVISION OF FOOD MACHINERY AND CHEMICAL CORP., LANSING, MICH., for (1) special Dutch Elm disease data; (2) catalogs pointing out features of the new Rotomist sprayers, and (3) up-to-date mosquito control information.

(See page 58 for more Bulletins)

CUT YOUR REFUSE-HANDLING LABOR COSTS

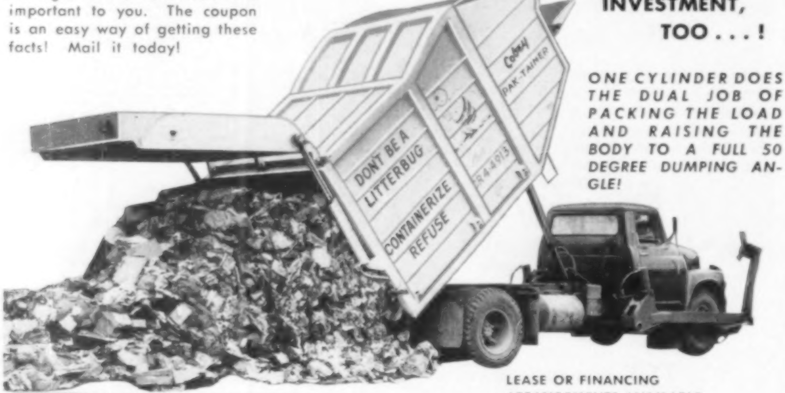
With the NEW COBEY | *PAK-TAINER SYSTEM*

AS MUCH AS 96%

and CUT YOUR CAPITAL INVESTMENT, TOO . . . !

Fantastic savings? Not at all! If you are using packer-type collection bodies, the Cobey Pak-Tainer System will cut your truck crews from 3 men to 1 man! Collection time for picking up an average 1200 gallons of refuse is cut from 27 minutes to as little as 4 minutes — with one man — the truck driver! ***Refuse-handling labor costs are reduced as much as 96%.*** And the Cobey Pak-Tainer, as a collecting and dumping unit in itself, has more to offer than any other like unit. Lower initial body cost! Lower-rated, lower-cost truck chassis used. Faster handling of containers! Level-Matic Spill-Proof Container dumping. And many other advantages. The full facts are important to you. The coupon is an easy way of getting these facts! Mail it today!

ONE CYLINDER DOES THE DUAL JOB OF PACKING THE LOAD AND RAISING THE BODY TO A FULL 50 DEGREE DUMPING ANGLE!



LEASE OR FINANCING ARRANGEMENTS AVAILABLE

- Handles all refuse — wet or dry. Built-in sump.
- Jaw-Crusher, bottom-hinged packer plate delivers 65,000 lbs. pressure.
- Requires no special training of operator.
- Level-Matic Feature avoids container swaying — eliminates spillage.
- Handles off-dock containers.
- Lift-Arm capacity — 4,500 lbs.
- Standard or special-type containers available 1 to 6 cu. yd. capacity.

The Cobey Containerized System of refuse collecting is the accepted and fast-growing method of using one truck and one driver — operates to pick up and dump any number of refuse containers.

THE COBEY CORP.
GALION, OHIO

THE COBEY CORPORATION Galion, Ohio

Yes! Send me full facts on Cobey's Containerized System.

NAME ________________ TITLE ________________
MUNICIPALITY ________________
ADDRESS ________________
CITY ________________ STATE ________________

In CANTON, OHIO*

TYLOX

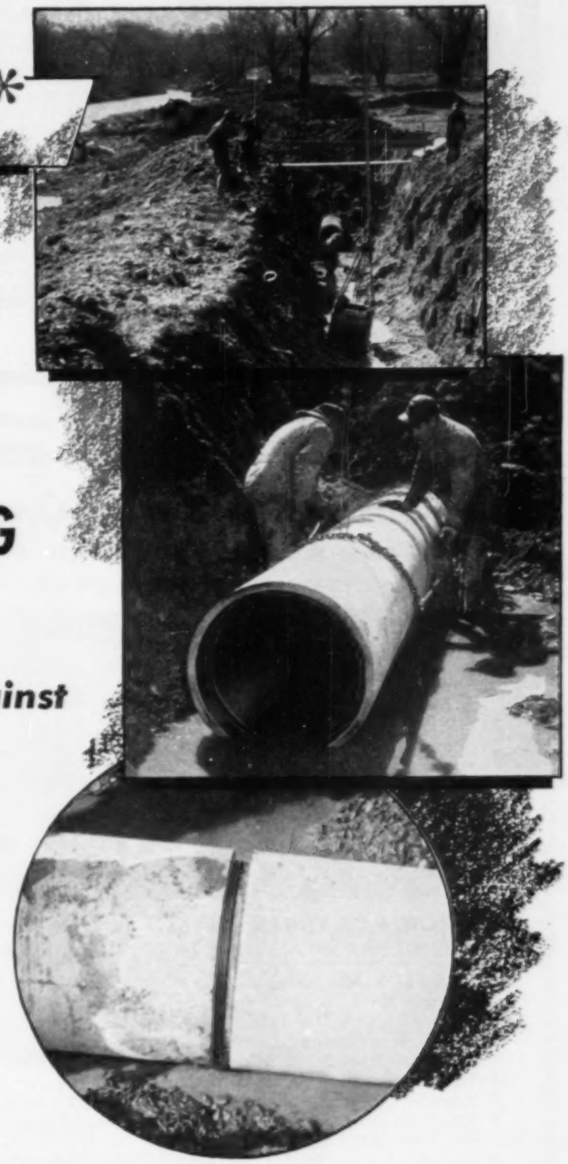
RUBBER PIPE JOINTS

and

REXON PIPE COATING

"team up"

to prevent leaks and guard against corrosion of new city sewers



Engineers had their eyes on future as well as present costs when they designed Canton's recent sewer expansion project. Here's how their call for TYLOX-jointed, REXON-coated concrete pipe helps assure Canton citizens of "most for the money" from their tax dollar . . .

NO JOINT LEAKS – even under tough conditions like those shown in the top photo. TYLOX prevents infiltration . . . keeps treatment plant loads at a minimum . . . eliminates root and sediment penetration.

NO ACID ATTACK – even though industrial wastes may enter the line. REXON Coating (center photo) is resistant to virtually all acids, alkalies, greases and solvents. "Teamed up" with equally durable TYLOX Joints, the resulting line is corrosion-resistant *throughout*.

FAST PIPE-LAYING – Just shove gasketed pipe home (lower photo) and the TYLOX Joint is complete. Wet trenches do not delay the work, and the *flexible* TYLOX permits immediate backfilling.

* **PROJECT:**	Stark County sewer expansion project, Canton, Ohio
ENGINEER:	A. T. Hall, Stark County Sanitary Engineer
CONTRACTOR:	Shullo Construction Co., Akron, Ohio
PIPE:	Reinforced concrete, TYLOX-Jointed and REXON Coated, manufactured by United States Concrete Pipe Company, Cleveland, Ohio.

5062-3

Plan now to specify TYLOX Rubber Joints and REXON Pipe Coating on your next concrete pipe job and be assured of leakproof, corrosion-resistant lines laid faster . . . Write for more details today.

CANADIAN: 3194 Mavis Rd.
Cooksville (Toronto), Ontario

HAMILTON KENT
MANUFACTURING COMPANY
KENT, OHIO
427 West Grant St. ORchard 3-9555

FREE catalogs

You will find of interest

Write to address given or circle corresponding number on free post card on page 51.

Planning a Municipal Incineration Plant?

310 Familiar with the continuous feed, automatic Amer-O-Matic incinerator? AMERICAN INCINERATOR CORP., 5710 E. NEVADA, DETROIT, MICH. can supply the facts. It also offers the assistance of its design and combustion engineers and specialists to help you solve your waste disposal problems.

Flocculating Agents, Coagulant Aids

311 A new series of flocculating agents and coagulant aids is said to effectively increase settling rate and reduce turbidity of water. A 4-page bulletin on Mogul Claracel explains fully. Write THE NORTH AMERICAN MOGUL PRODUCT CO., STANDARD BLDG., CLEVELAND 13, OHIO.

Hydraulic-Drive Tailgate Spreaders

312 . . . for ice control, dust control, road building and maintenance operations, and engineered to fit all models of dump trucks, are highlighted in a well-illustrated and detailed bulletin, available from THE FLINK CO., STREATOR, ILL.

Getting Water Meter News

313 If you want to learn about Rockwell Sealed Register magnetic water meters, why not ask the "man" who makes them — ROCKWELL MFG. CO., DEPT. 159C, PITTSBURGH 8, PA.

It's New to the John Deere Line

314 By writing to JOHN DEERE, 3300 RIVER DRIVE, MOLINE, ILL., you can obtain literature on a smooth-handling wheel loader that eases tough loading and material handling jobs, and a power-matched backhoe that tackles major trenching jobs—both members of the new "3010" Wheel Power line.

Portable Paving Plant

315 Here's a high-production paving plant that delivers 360 batches per hour (within specification tolerances). It's just been added to the well-known Nomad line. For catalog literature, write ENGINEERED EQUIPMENT, INC., WATERLOO, IA.

New Catalog on Park Tractors

316 . . . describing the recently introduced Beaver Model 750 and 750E includes photos of these units in actual field operation, pictures of the grounds maintenance attachment line offered, and complete tractor specifications. Write BEAVER RIDING TRACTOR DIV., THE BAIRD MACHINE CO., STRATFORD, CONN.

Trenches Up to 800 Feet an Hour

317 Features and merits of the Trench-Hog are covered in full-facts literature, which points out that the unit digs trench from 6 to 20 inches in width, 3½ to 7 feet in depth, and comes with a choice of cutters to meet varying soil conditions. Write ARPS CORP., DEPT. AC, NEW HOLSTEIN, WIS.

Pipe Joints and Pipe Coating

318 When you specify Tylox rubber joints and Rexon pipe coating on concrete pipe jobs, reports HAMILTON KENT MFG. CO., 427 W. GRANT ST., KENT, OHIO, you get leakproof, corrosion-resistant lines laid faster. Literature available on request.

Designed for City Work

319 Here's a unit that digs ditches, lays pipe, truck-loads dirt, rips old pavement, spreads material for street repair, levels and backfills. Why not ask CLARK EQUIPMENT CO., CONSTRUCTION MACHINERY DIV., 2495 PIPESTONE RD., BENTON HARBOR, MICH., for details on the Model 55A Michigan?

New Street Flusher Bulletin

320 All body styles of E. D. ETNYRE & CO., OREGON, ILL., street flushers are included in *Bulletin* No. 306C, which gives standard equipment specifications with detailed descriptions of the most important features, optional equipment, standard tank capacities with weights and mounting data.

Traffic-Bearing Fire-Proof Roof Tile

321 *Folder* BM-243 reports on Promenade Tile, a traffic-bearing, fire-proof tile of asbestos cement, a product of KEASBEY & MATTISON CO., AMBLER, PA. Uses in providing usable roof space for recreational and other purposes are given, as are data on sizes and weights available.

They Spell A Cleaner Community

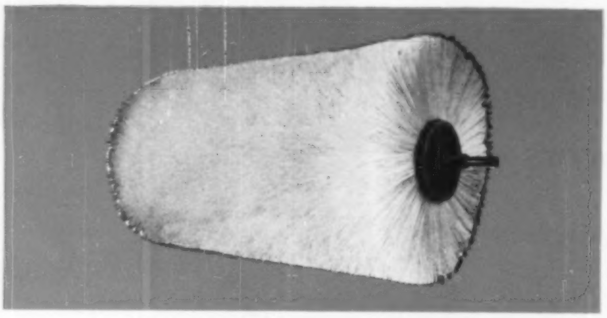
322 Community sanitation your bailiwick? *Bulletin* A-433-A features a self-packing, self-unloading refuse body which can be loaded from both sides. *Bulletin* A-457 highlights a vacuum method for cleaning leaves from streets and gutters. Write BAUGHMAN MFG. CO., INC., 307 SHIPMAN RD., JERSEYVILLE, ILL.

(See page 61 for more Bulletins)

ROAD-TESTED Prostran®

Saves Jersey Town* Up To 35%

YOU CAN SAVE THIS KIND OF MONEY ON YOUR STREET SWEEPING OPERATION, TOO!



YOU GET THESE BENEFITS WITH PROSTRAN-POLYPROPYLENE STREET SWEEPING FIBRE

- Superior To Any Natural Or Synthetic Broom Material
- Reduced Cost Per Sweeping Mile
- Longer Lasting Use-Life
- Excellent Sweeping Efficiency
- Minimum "Down-Time" for Repeated Broom Filling
- Toughness and Superior Abrasive Action
- Excellent Flex-Life for Ideal Bend Recovery
- Excellent Resistance to Chemicals, Solvents, Greases, Oils and Many Common Acids
- Lightest Weight Of All Synthetics – More Bulk Per Pound
- Heavy Duty Efficiency and Clean Sweeping
- Top Performance Under All Weather Conditions

DISTRIBUTED IN UNITED STATES BY:

New England States
Atlantic Broom Service, Inc.
60 McDonald Street
Readville 36, Massachusetts

Texas, Louisiana
Dallas Brush Mfg. Co.
5108 N. Westmoreland
Dallas 7, Texas

U. S. A. — except as listed
Tuffibre Co., 17 Kearney St.
East Orange, New Jersey
Branch Warehouses Nationwide

IN CANADA BY:

Eastern Canada
Sicard, Inc.
2055 Bennett Ave.
Montreal, Quebec

Manitoba, Saskatchewan
Atlas Brush Ltd.
McDermot & Lydia Sts.
Winnipeg 2, Manitoba

Alberta, British Columbia
Brodie Brush Co., Ltd.
891 Cambie St.
Vancouver, British Columbia

*Details on request

PHONE
Burlington, Vt.
UNiversity 4-7414

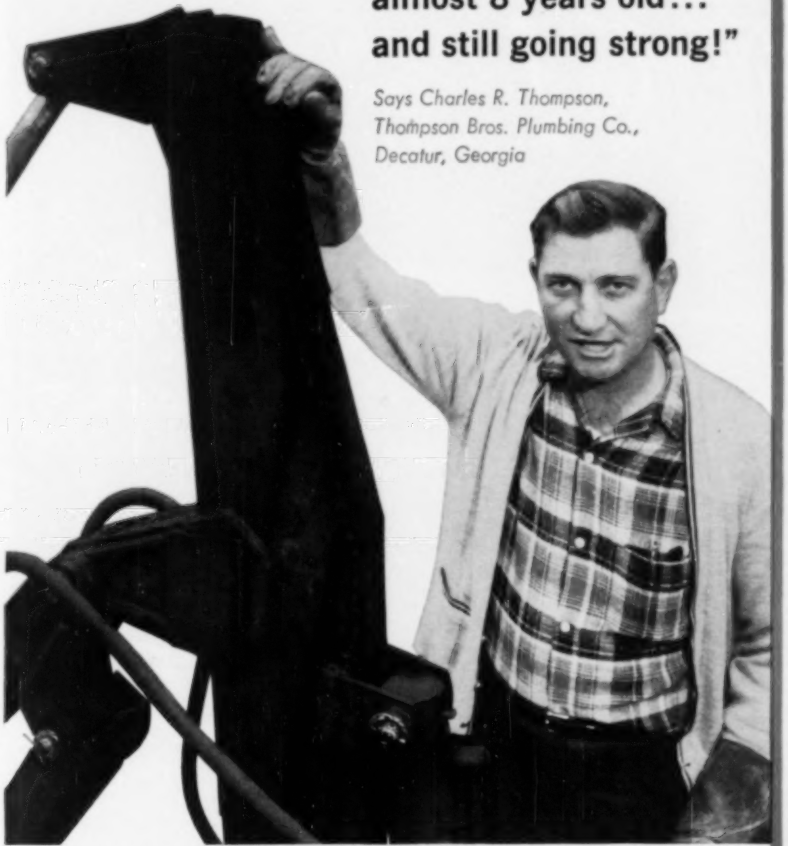
E.B. & A.C. WHITING COMPANY
Burlington, Vermont

Old Shermans Sell New Shermans

The old...

"This Sherman is almost 8 years old... and still going strong!"

Says Charles R. Thompson, Thompson Bros. Plumbing Co., Decatur, Georgia



"We bought our first Sherman in 1953. When business grew, we bought another. From the first day we had them, both Shermans have been in constant use—at any given time we have about 20 jobs in progress—requiring only minimum maintenance to keep them running in equal-to-new condition. By now, our two Shermans have delivered a total of more than 11 years continuous service, amounting to more than 33,000 operating hours, in some of the toughest imaginable situations. They seem to be indestructible ... **we figure to keep on using Sherman products.**"

Why not find out what Sherman can do for you? See your Ford dealer... Check the yellow pages or write to Allied Equipment, Ford Motor Company, 2500 E. Maple Rd., Birmingham, Michigan.

SHERMAN

POWER DIGGERS • LOADERS • AUXILIARY TRANSMISSIONS

And the New...

SHERMAN BOBCAT DIGGER

Compact, maneuverable 8′ or 10′ digger for light budgets, tight spots—cemeteries, inside work—or where light weight is necessary.

SHERMAN PANTHER DIGGER

Big and fast, with typical Sherman dependability . . . 12′ digging depth, 188° swing, exclusive filter gauge, much more for high production, low maintenance.

SHERMAN MAJOR DIGGER

Here's a perfect pair—match Sherman's durability, dig-ability with Fordson's rugged diesel economy. 12′ digging depth.

ALSO...

12 speeds instead of 4—For more power, more economy, equip your 4-speed Ford tractor with the Sherman 12-speed combination step up—step down transmission to **exactly** match power and speed to every job. Or, for fast shuttling, install a time-saving Sherman **reversing transmission.**

FOGGING!

THE PROVED EFFICIENT WAY TO CONTROL INSECT PESTS

SEEBURG SEE/FOG!

HIGH-CAPACITY APPLICATOR SO COMPACT THAT ONE MAN EASILY MANAGES IT

SEE FOG
SEEBURG INSECTICIDAL FOGGER
OPERATING INSTRUCTIONS

THE EFFICIENT, LOW-COST UNIT FOR USE IN SANITATION AND AREA CONTROL OF MOSQUITOES, FLIES, AND OTHER PESTS

- Unit weighs only 68 pounds.
- Dimensions only 36 x 12 x 15 inches.
- Only one moving part.
- Easily put into operation in minutes.
- Produces effective fog in less than 3 minutes after starting.
- Calibrated flow-meter for accurate measurement in gph of insecticide.
- Remote fog control for driver of the fogging vehicle.
- Output as high as that of larger, much heavier units—capacity variable to 45 gph.
- Priced for low original cost.
- Designed for low operating cost.

Wherever *persons* live or gather, and are pestered or endangered by insects—

Wherever *insects* congregate, to the detriment of public health and personal comfort—

SEE/FOG's fast, efficient fogging delivers economical insect kill and control. Quickly and easily mounted on truck, trailer, Jeep, station wagon, or boat. One-man operation.

For further information write Dept. A, SEE/FOG Division, The Seeburg Sales Corporation, 1500 No. Dayton St., Chicago 22.

ANOTHER QUALITY PRODUCT OF SEEBURG

Sold and serviced by Seeburg franchised distributors in principal cities.

MONEY SAVING *catalogs*

Write to address given or circle corresponding number on free post card on page 51.

The D-15

323 . . . a big-wheeled municipally-sized tractor with self-loading bucket, great breakout and lifting capacity, comfortably handles a full 1-yard loader bucket. It's just one Utility tractor described in a full-line catalog, available from ALLIS-CHALMERS MFG. CO., UTILITY TRACTORS AND EQUIPMENT, MILWAUKEE 1, WIS.

Sewer Odor Control

324 By masking existing odors, preventing others by destroying odor-producing microorganisms, and controlling growth of fungi which speed waste decomposition, Zep-O-Ban achieves heavy-duty odor control in sewage systems. Write ZEP MFG. CORP., 1310 SEABOARD INDUSTRIAL BLVD., N. E. ATLANTA, GA.

New Gasoline-Powered Horizontal Boring Units

325 . . . bring power, portability and speedy performance to the job site. Model G-160 bores holes through 36-inch diameters, pushes steel casing simultaneously; Model G-16, 2½-inch through 12-inch diameters. For details, write KWIK-MIX CO., KA-MO TOOLS DEPT., PORT WASHINGTON, WIS.

How Much Work Can a Tractor-Shovel Do?

326 THE FRANK G. HOUGH CO., 710 SUNNYSIDE AVE., LIBERTYVILLE, ILL., can tell you what a Payloader can do and how it delivers "more mileage for your tax dollar."

Does Your Lawn Mower Work for You?

327 Or do you work for your lawn mower? If you answer "yes" to the latter question, then you'll no doubt want to peruse the new lawn mower data sheets made available by LOCKE MOWER DIV., THE LOCKE STEEL CHAIN CO., 1315 CONNECTICUT AVE., BRIDGEPORT 1, CONN.

Pipe Detectors

328 File No. AC-148 provides description and specifications for the "808" Detectron, an all-new, fully-transistorized pipe detector with the first circuitry developed specifically for use with transistors. Write COMPUTER-MEASUREMENTS CO., UTILITIES INSTRUMENTS DIV., 12970 BRADLEY, SYLMAR, CALIF.

Cuts Asphalt

329 A 4-page bulletin from SPECIALTY MANUFACTURING INC., 4950 E. 70TH AVE., P. O. BOX 275, DENVER 1, COLO., gives outstanding features of a low-cost, high-speed asphalt cutter that cuts hot or cold mix, offers deep cutting penetration, and comes in several models for various machines.

New Lighting Standards Catalog

330 This 44-page catalog illustrates, describes and gives engineering data on a line of aluminum and steel trim tapered octagon lighting standards for street, highway, bridge and area lighting. For a copy, write KERRIGAN IRON WORKS CO., DEPT. A-3, NASHVILLE, TENN.

Engineering Drawing System

331 A booklet gives details on a precision microfilming system and describes the new Recordak engineering drawing system which is both dependable and automated. Write RECORDAK CORP., 415 MADISON AVE., NEW YORK 17, N. Y.

Reflective Traffic Beads

332 *Catalog* B-160 supplies full facts on these full-time workers, which will help you increase traffic safety. For a copy, write CATAPHOTE CORP., TOLEDO 10, OHIO.

Need a Snow Plow?

333 For Traxcavator, truck or motor grader? Or a dozer blade for landfill or stockpile operations? Why not acquaint yourself with the BALDERSON INC., WAMEGO, KANS., line? Literature will be sent on request.

Heard About the Easy-Read?

334 It's the first magnetic drive water meter with a disc meter chamber. A new, 4-page bulletin will tell you more. For a copy, write BADGER METER MFG. CO., 4545 W. BROWN DEER RD., MILWAUKEE 23, WIS.

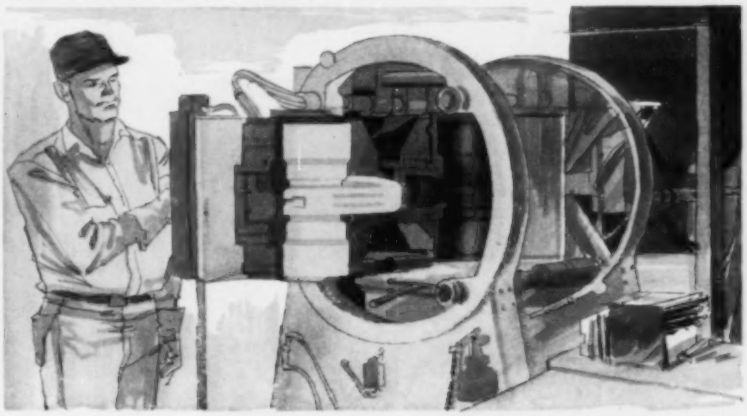
Lime in Asphalt Paving

335 *Bulletin* 325 explains how lime improves hot asphalt mixes, by serving as a stabilizing chemical additive which fills voids and imparts strength, stability and waterproofing qualities. It also upgrades marginal pit-run materials into high quality hot mix aggregates. Test data are included. For single free copy, write NATIONAL LIME ASSN., WASHINGTON 5, D. C.

Medium-Duty Trucks

336 Design, engineering, construction—all features that contribute to making the 1961 Chevrolet medium-duty trucks rugged, durable, top-notch performers—are to be found in literature, available from CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICH.

(See page 62 for more Bulletins)



after 34 YEARS

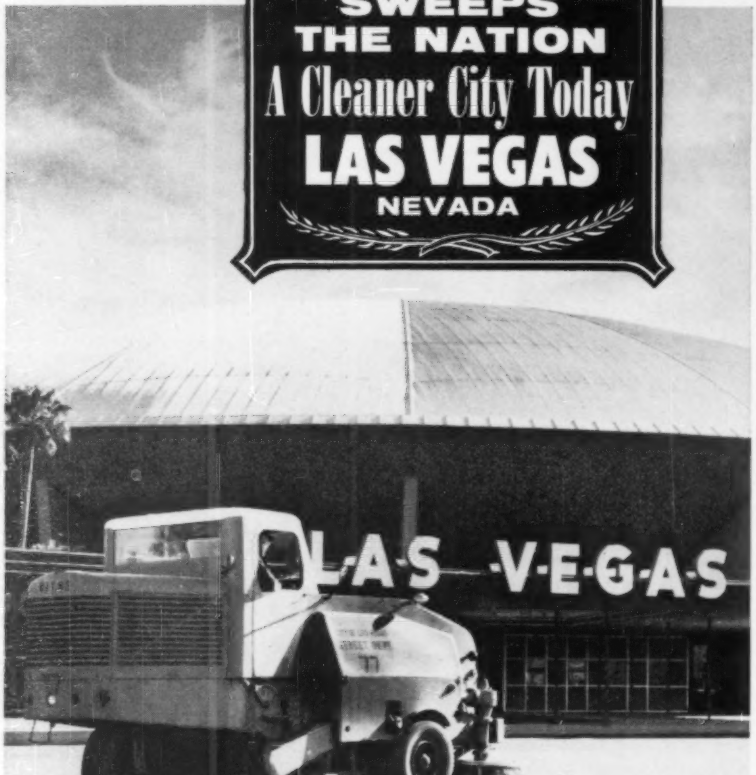
M & H is proud to be recognized as a true symbol of America's famous industrial revolution which has been in progress for some 50 years. The Company's growth is a typical success story of American ingenuity, engineering talent, manufacturing skills, labor-management team work, and mechanization.

With 40 employees and second-hand equipment, M & H started business in 1926 at the height of American industrial development. Later the product was redesigned and modernized, and the plant completely mechanized. Since that time modernization has been almost continuous. Recent years have seen installation of automatic core-sand handling, automatic core-making machines, automatic foundry equipment, new and enlarged machine shop, new two-story office building, and many other improvements.

M & H valves, hydrants and associated products today are in use throughout the United States, Canada, and in many foreign countries. Water works men, engineers and industrial operators recognize the enviable reputation of M & H products for being made from highest quality material, rugged in design, dependable and efficient service.

(No. 10 of a Series)

M&H VALVE
AND FITTINGS COMPANY
ANNISTON, ALABAMA
SUBSIDIARY OF WALWORTH



DANLINE
SWEEPS
THE NATION
A Cleaner City Today
LAS VEGAS
NEVADA

NEWARK

Ah, Las Vegas, noted for fun 24 hours a day, and the wise men who run the city. Kelton E. Bainum, Supt. of Streets and Garage had this to say, "Our first Danline was a "tongue-in-cheek" experiment. So many plastic and synthetic materials had fallen short of expectations. The initial test with the Danline indicated we could realize a 30% reduction in broom costs at the very least. In fact, it is more nearly 50%, and this with much cleaner streets. 2300 to 2500 sweeping miles is common with an occasional 3000 mile life between changes. These mileages result in a 7½¢ to 9¢ broom cost per mile." Your city can also benefit from Danline. We invite your inquiry.

59-52

Leadership Proved Through Performance!

NEWARK BRUSH COMPANY
260 MICHIGAN AVE., KENILWORTH, N. J.

CATALOGS *for Improved Municipal Services*

Write to address given or circle corresponding number on free post card on page 51.

Police Cars

337 In the 1961 line of Plymouth police cars there's a model for every need—the high-speed pursuit for the open highway, one for patrol in mountainous areas, one geared to the demands of 24-hour city driving. PLYMOUTH MOTORS, 6334 LYNCH RD., DETROIT, MICH. will supply the facts.

Surveyor's Instruments

338 Accurate, rugged, quick-operating, this theodolite with readings direct to 1 second proves itself well suited for triangulation and laboratory use. *Booklet* T-2 describes it and its range of accessories. Write WILD HEERBRUGG INSTRUMENTS, INC., PORT WASHINGTON, N. Y.

Limited Money-Saving Offer

339 TRACTOR AND IMPLEMENT DIV., FORD MOTOR CO., BIRMINGHAM, MICH., reports that it will pay half your fuel bills of 6 months (or 400 tractor hours) on the purchase of any new Ford or Fordson diesel tractor. Offer is good till March 31, 1961.

Designed for Water Works Service

340 JAMES B. CLOW & SONS, INC., 201-299 N. TALMAN AVE., CHICAGO 80, ILL., makes materials to meet exacting specifications for plant and water distribution service. Literature covers entire product line.

Insect Pests Beware!

341 These insecticidal fog generators invariably get their "man"—through fog mist or spray, by complete envelopment. Seven thousand communities use TIFA applicators for low-cost, effective space control. Write TODD SHIPYARDS CORP., PRODUCTS DIV., COLUMBIA & HALLECK STS., BROOKLYN 31, N. Y.

Dependable Gas Engines

342 The newest ROIline gas engines include in-line 6, V-8 and V-12—up to 706 hp. They're constructed for heavy-duty long life, to deliver power along with economy, to operate smoothly, quietly and for easy maintenance. For literature, write WAUKESHA MOTOR CO., WAUKESHA, WIS.

This Pump

343 . . . handles 300 gpm, 18,000 gph, is self-priming, guarantees 28-foot suction lift, is portable and of non-clogging design. For descriptive literature giving specifications and applications of the "300," write HOMELITE, a division of TEXTRON INC., 103 RIVERDALE AVE., PORT CHESTER, N. Y.

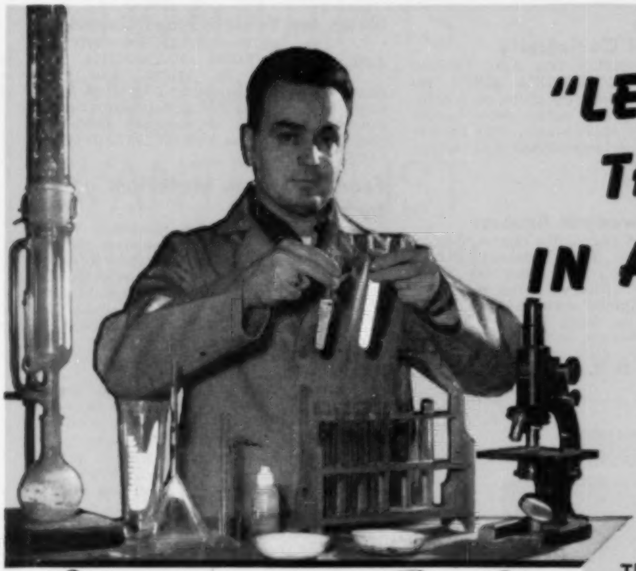
Radar Speed Check

344 *Bulletin* R-115 gives details on a reliable, easier to use and more accurate radar speed meter with fully transistorized circuitry—the new Model S-5 Electro-Matic with three switch-selected ranges. Write AUTOMATIC SIGNAL DIV., EASTERN INDUSTRIES, INC., NORWALK, CONN.

Municipal Water Plants

345 . . . using liquid chemicals will be interested in the Series 100, latest addition to the plunger meter pump line of WALLACE & TIERNAN INC., 25 MAIN ST., BELLEVILLE 9, N. J. Capacities range from .95 gph vs. 1200 psi, to 50 gph vs. 100 psi, at accuracies within 1%. Request Catalog 420.00.

(See page 64 for more Bulletins)



"LET ME SHOW YOU THE DIFFERENCE IN A TRULY WHITE, LEAD-FREE REFLECTIVE BEAD"

66
SPEED LIMIT 50
SLOW

There is a marked difference in reflective bead quality, determined largely by degree of whiteness and lead-free quality. On these two important factors depends the brilliance, reflectivity and ultimate performance of the product. To meet Flex-O-Lite's rigid quality standards, only the *whitest white, lead-free* beads can pass inspection. Add to this, technological advances, long experience and manufacturing know-how and you have the reasons why highway signs and markers, reflectorized with Flex-O-Lite beads, literally leap out of the darkness to contribute greater safety for the motoring public . . . greater satisfaction and economy for you. Write for new brochure today.

FLEX-O-LITE PRODUCTS

1. **No. 831 LEAD-FREE** High Index of Refraction Beads and Sign Kits. Best for white and yellow signs.
2. **UB 68 LEAD-FREE** Medium Index of Refraction Beads and Sign Kits. For application to signs in the darker pigment colors—greens, reds, blues, etc.
3. **TYPE H SAFETY SPHERES**—For danger points such as guard rails, curbs, bridge abutments, medians, hydrants and other hazardous areas where ultra-high brilliance is required. Many times brighter than paint or ordinary reflectorization.
4. **TRAFFIC BEADS**—Free Flowing, Moisture-Proof and Standard Beads. Tops in eye-catching brilliance and dependable reflectorization on highway center lines and edge line markings.
5. **ALL-WEATHER AIRPORT RUNWAY BEADS**—500 to 1,000% brighter than standard beads at angles of descent ranging from 10 to 30%.
6. **FLEX-O-LITE ALSO MAKES:** New Positive Free-Flowing Traffic and Sign Bead Dispensers. The economical answer to the problem of reflective glass bead application. Details on request.

FLEX-O-LITE

FLEX-O-LITE MANUFACTURING CORP.

8301 Flex-O-Lite Drive, St. Louis 23, Missouri • Flex-O-Lite of Canada, Ltd., P. O. Box 216, St. Thomas, Ontario, Canada • Paris, Texas
MAKERS OF DROP-ON, FREE-FLOWING, STANDARD, MILITARY, MOISTURE-PROOF, HIGH AND MEDIUM INDEX SIGN BEADS

FREE catalogs

You will find of interest

Write to address given or circle corresponding number on free post card on page 51.

For Refuse Collectors Only

346 A refuse collection body with a large, low hopper that reduces packing cycles and speeds collection is subject of literature available from GAR WOOD INDUSTRIES, INC., WAYNE, MICH. For one collection service in Overland Park, Kans., the Load-Packer 600 has saved 203 man-hours per day.

2-Way Radio for the Small Community

347 E. F. JOHNSON CO., 2101 TENTH AVE., S. W., WASECA, MINN., reports the "Messenger" to be ideally suited for use by the small municipality in police and fire applications. Full details can be obtained by requesting explanatory booklet.

Plastic Filler for Street Sweeper Brooms

348 Wynene 18 polyolefin broom filler, a product of The National Plastic Products Co., has been especially engineered for rotary street-sweeping brooms. Performance tests indicate it has characteristics that help cut street-sweeping costs. For details, write FREDERICK H. CONE & CO., INC., 181 FRONT ST., NEW YORK 38, N. Y.

products for the public good

SINCE 1898

THEY PROVE THEIR WORTH

. . . The elections recently held demonstrated once more the value of voting machines . . . The machines assure an accurate count . . . human counting in a race as close as that . . . would surely have resulted in a call for a recount . . . but the machines have no emotions and no preferences. Voting machines are more than a convenience. They are a necessity . . .they not only increase the speed and accuracy of the tabulation, they reduce confusion and opportunity for election chicanery.

from the Mansfield News-Journal, Mansfield, Ohio

AUTOMATIC
VOTING MACHINE
division of Rockwell Manufacturing Co.
Jamestown, N.Y.

News for Vehicle Fleet Owners

349 For 1961 AMERICAN MOTORS CORP., 14250 PLYMOUTH RD., DETROIT 32, MICH., has introduced three new series of Ramblers. Economy-minded municipal government departments interested in compact fleet cars should write to the FLEET SALES DEPT. —DEPT. AC-3.

Feeds Dry Bulk Materials by Volume

350 These dry feeder machines handle all types of dry materials ranging from fine amorphous types to coarse lumps. They flow material by vibration and provide constant volume flow in treatment of water and sewage disposal. For literature, write SYNTRON CO., 430 LEXINGTON AVE., HOMER CITY, PA.

Cast Iron Pipe

351 This pipe is tough and has proved its service longevity for over 100 years. Today's cast iron pipe has undergone improvements that make it still tougher, stronger, more uniform in quality. Let WOODWARD IRON CO., WOODWARD, ALA. tell you about its qualities and its applications.

Overhead Maintenance No Problem

352 Tree pruning, street and traffic light installations, utility and line work—whatever the above-ground level municipal maintenance work, you'll find using a Hi-Ranger will expedite it with speed, safety, flexibility. Write MOBILE AERIAL TOWERS, INC., 1730 N. HARRISON ST., FT. WAYNE, IND.

Electronic Traffic Controllers

353 CROUSE HINDS, SYRACUSE, N. Y., will, upon request, send complete technical information on its vehicle-actuated electronic traffic controllers, which are designed to provide the choice of basic controller and accessories that will give most efficient command of any specific intersection.

Salvage Covers

354 A complete line of duck and nylon salvage covers, which will measureably help minimize smoke and water damage, are thoroughly covered in literature now being offered by FULTON COTTON MILLS, P. O. BOX 1726, ATLANTA 1, GA.

When You Roll It Along

355 You'll find this measuring wheel records 100,000 feet automatically, shows inches and fractions of an inch, and tenths of a foot. For details on this and other models, write ROLATAPE, INC., 1741 14TH ST., SANTA MONICA 2, CALIF.

Rigid Plastic Pipe

356 MARBON CHEMICAL, division of BORG-WARNER, WASHINGTON, W. VA., has available literature on rigid pipe made of ABS plastic and approved for deepwell submersible pump installations and for carrying potable water.

Increase Concrete Performance

357 Concrete treatment compounds based on Parlon chlorinated rubber eliminate hydration problems, offer rainfall protection within ½ hour after application, develop an integral seal, resist alkali damage. Write HERCULES POWDER CO., HERCULES TOWER, 910 MARKET ST., WILMINGTON 99, DEL.

An Easy Way to Make Municipal Signs

358 Just about every municipal department with use for signs and nameplates will want to learn about the Engravograph, a tracer-guided engraving machine that expedites and simplifies sign-making. Write NEW HERMES ENGRAVING MACHINE CORP., 154 W. 14TH ST., NEW YORK 11, N. Y.

(See page 67 for more Bulletins)

PLYMOUTH IS ON THE "WANTED" LIST IN 34 STATES!

Plymouth Police cars now patrol 472 cities in 34 states. And more and more law enforcement agencies are choosing these high-performance vehicles every day. Here's why: Plymouth has a Police Special for every need. High-speed pursuit on the open highway . . . patrol of rugged mountain areas . . . stop-and-go, 24-hour city driving. And Plymouth for '61 gives you durable Unibody construction, smooth Torsion-Aire suspension and heavy-duty 12-inch brakes at *no* extra cost! See your Plymouth dealer for the facts on why Plymouth is on "wanted" lists all across the country.

61 PLYMOUTH
SOLID PERFORMER

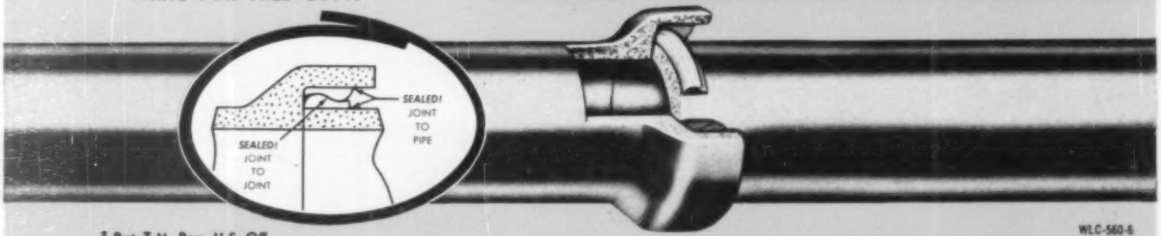
PUBLIC HEALTH BEGINS AT CITY HALL

Biggest, Best Sewer System *is only as good as the* House Connection

Unless house connections are as good as the main, infiltration can defeat the purpose of the newest, tightest, best engineered sewer system . . . Treatment plants pump huge amounts of ground water, capacity is taxed. Wedge-Lock* Clay Pipe helps cities beat this problem . . . Makes house connections *as good as* the main. Four through six-inch diameter Wedge-Lock gives triple protection against infiltration, exfiltration, roots, helps insure lines as good as the main. Wedge-Lock . . . safe enough to use *under* basement floors. Conforms to ASTM Specifications C 425-58T, Type 1. Put it in *your* plumbing code.

JUST OFF THE PRESS!
Brochure Describing Wedge-Lock Installations

WRITE FOR FREE COPY!



* Pat. T.M. Reg. U.S. Off.

WLC-560-6

Wedge-Lock* CLAY PIPE

THE FACTORY-JOINTED CLAY PIPE AVAILABLE NATIONALLY FROM LOCAL MANUFACTURERS

Write to any of these manufacturers for literature or a Wedge-Lock demonstration

Cannelton Sewer Pipe Company	Cannelton, Ind.	The Logan Clay Products Company	Logan, Ohio
The Clay City Pipe Company	Uhrichsville, Ohio	The Owensboro Sewer Pipe Company	Owensboro, Ky.
Graff-Kittanning Clay Products	Worthington, Pa.	Pomona Terra-Cotta Company	Greensboro, N. C.
Larson Clay Pipe Company	Detroit, Mich.	The Robinson Clay Product Company	Akron, Ohio
Lehigh Sewer Pipe & Tile Company	Fort Dodge, Ia.	Superior Clay Corporation	Uhrichsville, Ohio

CATALOGS *for Improved Municipal Services*

Write to address given or circle corresponding number on free post card on page 51.

Just Right for Sewage Treatment Plants

359 MOLINE MALLEABLE IRON CO., ST. CHARLES, ILL., specialists in chain manufacture can tell you about rugged chain designed for extra service and long wear and just right for sludge collection scrapers.

Manual Parking Meters

360 These meters help regulate traffic in over 500 cities. They are adjustable to any number of hours, accept coins from 1¢ to 25¢ through one coin slot. For other features, write MI-CO PARKING METERS, P. O. BOX 668-A, COVINGTON, KY.

Refuse Burner

361 By writing to WILCO MACHINE WORKS, INC., BOX 3897AC-4, MEMPHIS, TENN., you can obtain information on the Tepee Refuse Burner, a conical-shaped unit that economically, safely and efficiently disposes of bulky municipal wastes not suited for landfill.

Do Your Water Meters Earn Their Keep?

362 They do if they retain their accuracy of measurement over a sustained time period and if maintenance and repair costs are low. NEPTUNE METER CO., LIQUID METER DIV., 46-25 34TH ST., LONG ISLAND CITY 1, N. Y. can give you details on Trident meters.

Street Sweeper Broom Fibres

363 These top-quality fibres for street sweeper and gutter brooms include African bass, palmyra stalks, split hickory, polypropylene, "Tynex" nylon, flat steel wire. They are available at competitive prices. Write FLO-PAC FIBRES, INC., 1501 4TH AVE. S., MINNEAPOLIS 4, MINN.

Neither Snow Nor Mud

364 Cars and light trucks equipped with limited slip differentials stand little chance of getting stuck in mud or bogged down in snow, reports DANA CORP., TOLEDO 1, OHIO, which makes available a booklet showing how and where these gears work.

Puts a Quick End to Weeds

365 No need to let weeds choke you when you can choke them out, nonselectively, safely, completely. Brochure available from NATIONAL CHEMSEARCH CORP., 2417 COMMERCE ST., DALLAS, TEXAS gives details on four different kinds of weed killers.

Precise Surveying Instrument

366 *Brochure* K603 discusses the DKM1 Ten Second Theodolite with optical micrometer, a rugged, lightweight, accurate instrument for land surveying, triangulation, construction and engineering operations. Write KERN INSTRUMENTS, INC., 120 GRAND ST., WHITE PLAINS, N. Y.

Dependably Engineered Backhoes

367 A complete line of easy-operating backhoes with up to 14,000 pounds break-out capacity, 210° boom swing, independently controlled, extra-wide track hydraulic stabilizers to take the strain off the tractor frame are highlighted in literature, available from MASSEY FERGUSON INDUSTRIAL DIVISION, 1261 SOUTHFIELD RD., DETROIT 32, MICH.

What's New in Traffic Markers?

368 NATIONWIDE TRAFFIC ENGINEERING PRODUCTS CORP., 2535 MT. CARMEL AVE., GLENSIDE, PA., can tell you about a flexible, durable, safe traffic delineator engineered for long life and excellent for changing traffic patterns. Just ask for the Fixatron catalog.

Fire Hydrants

369 These hydrants conform to A.W.W.A. specifications. They include models with replaceable barrel, flange barrel, swivel joint and gate valves. All are described in the full-line catalog offered by R. D. WOOD CO., PUBLIC LEDGER BLDG., INDEPENDENCE SQ., PHILADELPHIA 5, PA.

Butterfly Valves

370 In highlighting and discussing the pertinent features of Darling-Pelton butterfly valves, *Bulletin* 5904 explains why these valves give drop-tight shutoff, have prolonged seat life, minimize maintenance. For a copy, write DARLING VALVE & MFG. CO., WILLIAMSPORT 10, PA.

Service Connections Made Easier

371 Power-operated tapping machines, combined drill and tap tools, corporation stops—products that will enable you to make dependable, leakproof service connections more quickly are the subject of literature available from MUELLER CO., DECATUR, ILL.

Police Statistics Point Out

372 . . . that vandalism and theft are reduced by as much as 65% with proper floodlighting. By writing to WIDE-LITE CORP., DEPT. F11, BOX 191, HOUSTON 1, TEXAS, you can obtain facts and helpful information on protective lighting designed for maximum light output at all around lower cost.

New Family of Luminaires

373 Complete catalog information and technical data are available on the 2600 Series Endoval luminaires for high-level, glare-free illumination of arterials and highways and on the 2500 Series Urbanoval luminaires for economical lighting on residential areas or secondary streets. Write REVERE ELECTRIC MFG. CO., 7420 LEHIGH AVE., CHICAGO 48, ILL.

This Slurry Machine

374 . . . makes possible the mixing and immediate application of slurry seals of fine aggregate, emulsified asphalt and water. It may be mounted on a 2 or 2½-ton short wheelbase truck, lays 2000 square yards per load, covers 4,000 square yards per hour. For details, write THE YOUNG CO., P. O. BOX 2369, WACO, TEXAS.

Traffic Line Marking Materials

375 In its current catalog PRISMO SAFETY CORP., HUNTINGDON, PA., presents and explains applicability and specific features of each of its traffic and line marking products.

100 Pages of Municipal Supplies

376 That's what the new W. S. DARLEY & CO., CHICAGO 12, ILL., "Municipal Supplies Catalog" contains. When making your request, please specify your title.

From Refuse Collector to Snow Remover

377 Equip a Dempster-Dumpmaster with a Snow Scoop and it becomes a valuable, efficient snow removal vehicle, able to scoop up snow, compress it in its body hopper and carry it off to a disposal point. For free brochure, write DEMPSTER BROTHERS, INC., DEPT. AC-2, KNOXVILLE 17, TENN.

Portable Water Coolers

378 The latest catalog from IGLOO, MEMPHIS 18, TENN., describes 23 sizes and models of portable water coolers, which will keep potable water clear, cool and fresh, keep municipal crews comfortable on the job, and help speed work when temperatures climb.

Bulletin GC-100

379 . . . will acquaint you with facts and features of a 1-ton hydraulic elevating trailer that lowers to ground level for easy, 1-man loading, then in seconds lifts its own load. Its municipal applications are numerous. Write TRAIL-EVATOR DIV., MAGLINE INC., P. O. BOX 42, PINCONNING, MICH.

Sewer Cleaning Equipment

380 Sewer cleaning problems got you down? O'BRIEN MFG. CORP., DEPT. AC261, 5632 NORTHWEST HWY., CHICAGO 46, ILL. will send information on powerized cleaning equipment—bucket machines, power rodder, cable machines, power rod drive.

Make Your Own Alum

381 A new process cuts the cost of alum use. New package plants provide from 3 to 120 tons per day. CHEMICAL CONSTRUCTION CORP., DEPT. A, 525 W. 43RD ST., NEW YORK 36, N. Y., will point out how you can save time, costs and gain added convenience through use of this new plant.

Sweeps Clean

382 Word from Omaha, Nebr. is that each of its Danline-brush-equipped street sweepers averages 1200-1300 miles of wear, delivering clean streets at lower cost per curb mile. Full story on these wire sweeping brushes can be obtained from NEWARK BRUSH CO., 260 MICHIGAN AVE., KENILWORTH, N. J.

Save Time, Save Money

383 *Bulletin* S-249 details the features of the Wisconsin line of heavy-duty air-cooled engines (3-56 hp) and explains how one basic Wisconsin-powered unit with attachments can create economies in maintenance work the year 'round. Write WISCONSIN MOTOR CORP., DEPT. U-11, MILWAUKEE 46, WIS.

Heavy-Duty Pipe Cutters

384 Water works men will appreciate these pipe cutters with the long-lasting cutter wheels, for they eliminate recutting, spoilage and pipe breakage, and they're available in three sizes for pipe up to 16 inches in diameter. Write ELLIS & FORD MFG. CO., 1100 COOLIDGE RD., BIRMINGHAM, MICH.

Diatomite Filters

385 *Bulletin* 626 discusses the use of diatomite filters for public swimming pools and public water systems. Performance, costs, operation and other pertinent factors are dealt with. For a copy, write R. P. ADAMS CO., INC., 232 EAST PARK DRIVE, BUFFALO 17, N. Y.

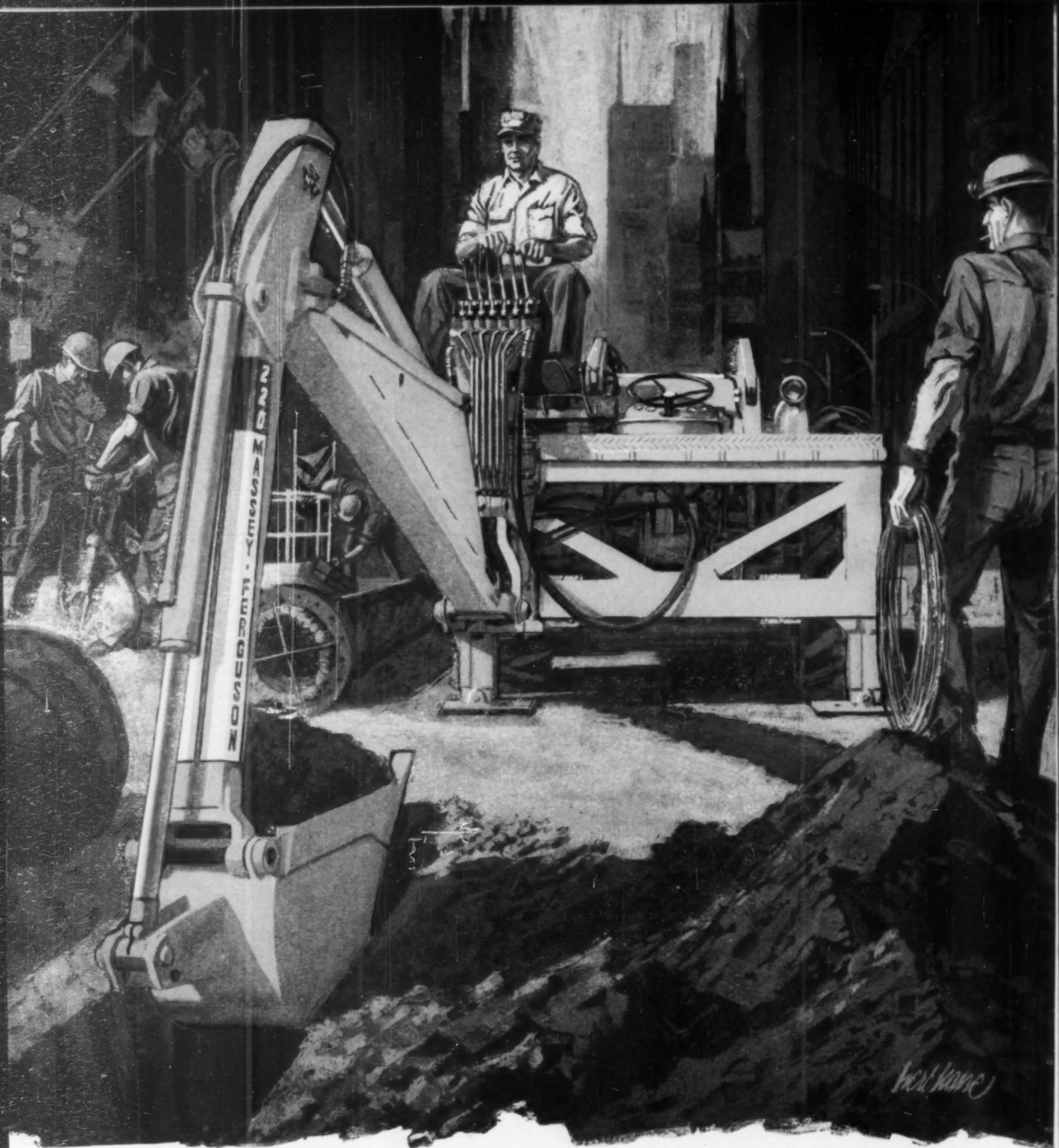
Avoid Water Main Breaks

386 BETHLEHEM STEEL CO., BETHLEHEM, PA., will provide, upon request, information showing why tar-enameled steel water pipe gives assurance against failure due to water hammer and surge.

Mercury Lamps

387 LIGHTING DIV., SYLVANIA ELECTRIC PRODUCTS INC., DEPT. 63, 60 BOSTON ST., SALEM, MASS., reports longer life, more light output, certified performance and lowest total cost of lighting for its "Banner" mercury vapors. Details sent on request.

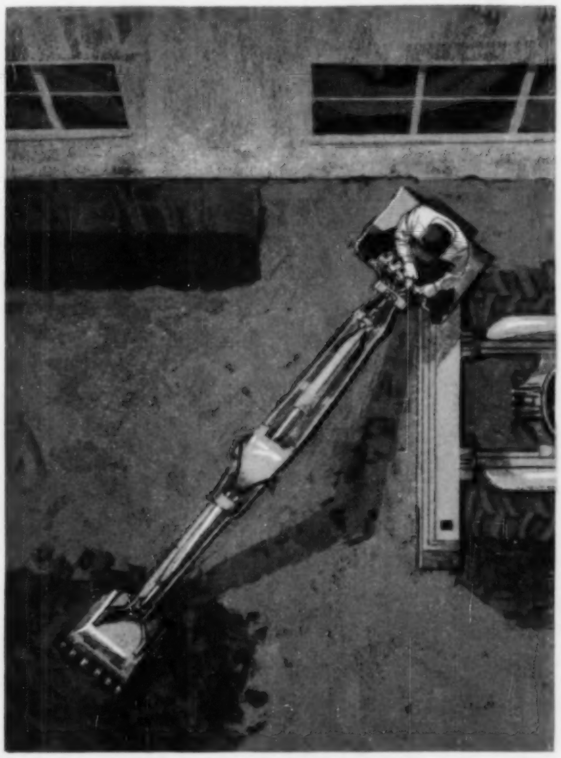
(See page 72 for more Bulletins)



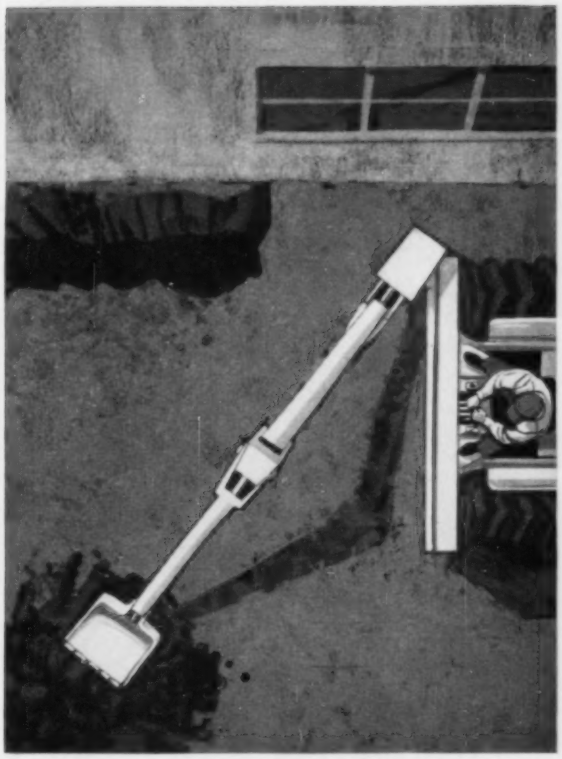
MASSEY FERGUSON INDUSTRIAL EQUIPMENT

When the world's largest tractor manufacturer . . . Massey-Ferguson . . . designs Industrial Equipment like this big-capacity Backhoe, years of advanced engineering know-how pay off for you. Exclusive features like the Hydra-Slide design you see on the opposite page make your operation faster, more precise, more efficient. The result is a Backhoe that out-produces all others . . . with no fatiguing strain on the operator.

Engineered to make the work go faster!

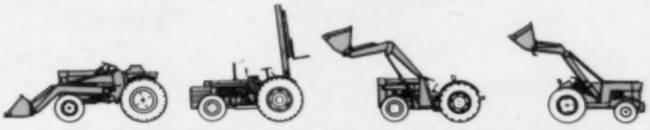


Massey-Ferguson Backhoes keep the operator conveniently in line with the job! Seat and controls rotate with the boom . . . shift hydraulically across the slide rail for digging flush against a wall or curbing. No tiring, stretching or straining.



Ordinary backhoes have the operator "glued" to one spot. He has to strain and twist in his seat just to see what he's doing. This makes it hard for him to do an accurate, efficient job, since he's not in line with his work.

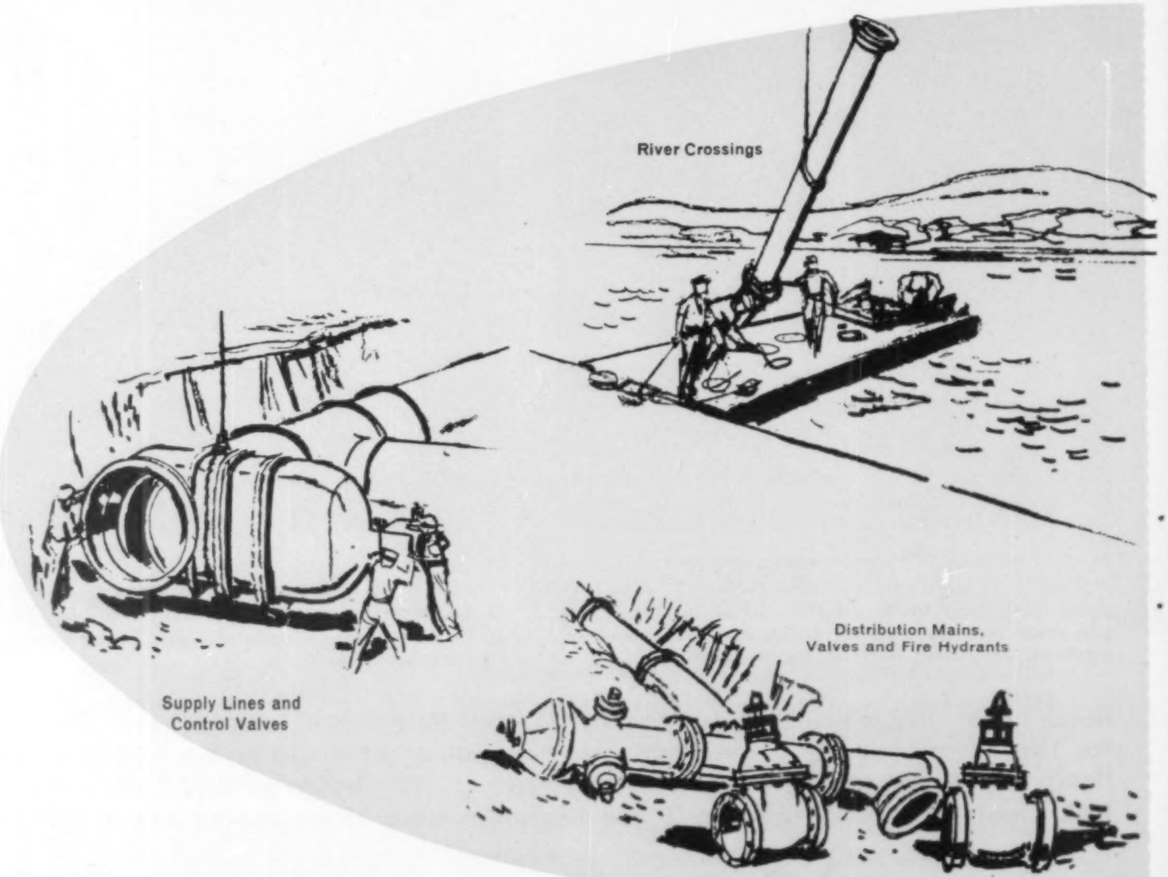
Some other things you'll want to know: Massey-Ferguson Backhoes have up to 14,000 lbs. break-out capacity . . . independently controlled, extra-wide-track hydraulic stabilizers to take the strain off the tractor frame . . . 210° boom swing . . . high capacity, leak-proof hydraulic cylinders. These Backhoes work anywhere on any digging job.



NEW KIND OF ENGINEERED
DEPENDABILITY PAYS OFF IN PROFITS!
Massey-Ferguson Industrial Division
12601 Southfield Road, Detroit 32, Michigan

CLOW

Products for every job!



River Crossings
Supply Lines and Control Valves
Distribution Mains, Valves and Fire Hydrants

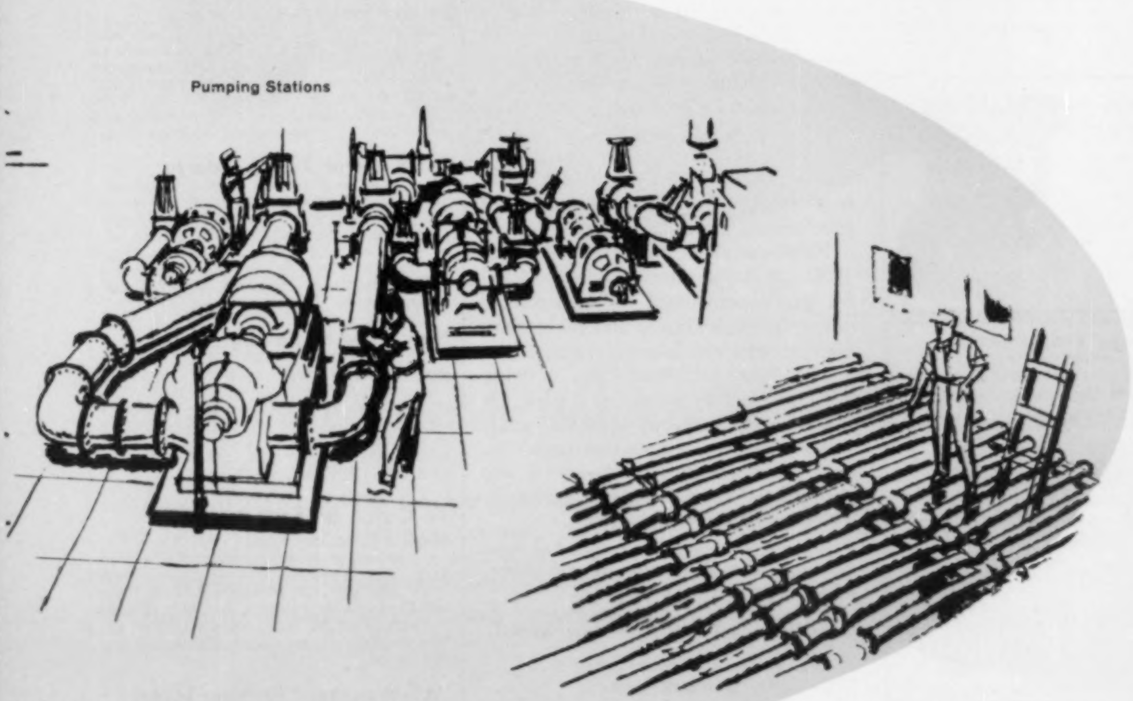
MEET EXACTING SPECIFICATIONS FOR PLANT & DISTRIBUTION SERVICE

For generations...since 1878...public officials, waterworks engineers and contractors have learned to count on CLOW products. Today, whether the need is for superior cast iron pipe, high quality hydrants, valves or fittings, or other waterworks specialties, CLOW products meet the exacting demands of plant and distribution service. CLOW facilities, experience and manufacturing skill are often invaluable in helping solve community pipe problems...in long line or extension mains, fire protection systems, filtration plants, pumping stations ...wherever distribution and control of water under pressure is involved.

Be sure...specify time-tested CLOW materials for *your* job.

JAMES B. CLOW & SONS, INC.
201-299 North Talman Avenue, Chicago 80, Illinois
subsidiaries
EDDY VALVE COMPANY • Waterford, N.Y.
IOWA VALVE COMPANY • Oskaloosa, Iowa

CLOW CAST IRON PIPE

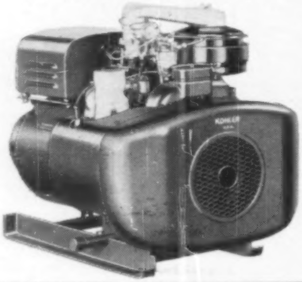


New Kohler Engine and Electric Plant Building

Capacity to meet growing sales

ENGINES
MODEL K161
4-cycle
Short stroke
Air-cooled
Sizes: 4 to 24 H.P.

ELECTRIC PLANTS
MODEL 5RM61
Sizes: 500 watts to
115 KW gasoline and diesel



Our customers' requirements will be met better than ever by the 12 acre new factory devoted entirely to the manufacture of engines and electric plants at Kohler, Wisconsin.

The building provides nearly three times the space formerly available, and allows for further expansion. Straight-line, one-floor production and newest equipment mean increased production, prompt deliveries.

Kohler engines, manufactured since 1920, are being increasingly specified for equipment used in agriculture, construction, industry and recreation. Kohler electric plants, known the world over for reliability, provide efficient electric power for a wide variety of sole supply, portable, automatic stand-by and marine uses.

Highest standards of service are assured by a nation-wide distributor and dealer organization.

The new factory is part of a continuing plan of expansion and diversification by Kohler Co.

Write for illustrated printed matter K-1

KOHLER CO. *Established 1873*
KOHLER, WIS.

KOHLER OF KOHLER

ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • ALL-BRASS FITTINGS
ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS

MONEY SAVING *catalogs*

Write to address given or circle corresponding number on free post card on page 51.

Weeds Out Weeds

388 How? Just send for the new 1961 52-page brochure prepared by FENC-PAINTER DIVISION, 4911 S. RACINE AVE., CHICAGO 9, ILL., and you'll learn all about Weed Out.

Nonclogging Sewage Pumps

389 Interested in thrifty, trouble-free, self-priming sewage pumps that can be connected to your power or ordered complete with power units? THE GORMAN-RUPP CO., 305 BOWMAN ST., MANSFIELD, OHIO, can give you the facts on sewage pumps in 2, 3, 4 or 6-inch sizes.

Bulletins for Water Works Men

390 *Bulletin* WH-851 is an 8-page analysis of the cause, effect and control of water hammer in piping systems; *Bulletin* WH-654 includes sizes and other data on Williams-Hager check valves, which control surge pressure. Copies available from THE WILLIAMS GAUGE CO., INC., 2 GATEWAY CENTER, PITTSBURGH 22, PA.

Algae, Aquatic Weed Control

391 You'll be much more knowledgeable about this subject after reading "The Use of Copper Sulfate in the Control of Microscopic Organisms" and "Copper Sulfate for Root and Fungus Control in Sanitary Sewers and Storm Drains," booklets available from PHELPS DODGE REFINING CORP., 300 PARK AVE., NEW YORK 22, N. Y.

Street-Maintenance Aid

392 Products to speed work and cut costs on street repair projects are to be found in an 11-page illustrated booklet offered by LE ROI DIVISION OF WESTINGHOUSE AIR BRAKE CO., SIDNEY, OHIO manufacturer of portable and stationary air compressors and air tools.

Build Better Tennis Courts

393 Planning tennis courts? Engineers at AMERICAN BITUMULS & ASPHALT CO., 200 BUSH ST., SAN FRANCISCO 20, CALIF., will advise the most economical type of base material to use, whether it be asphaltic aggregate, penetration macadam, asphaltic concrete, etc.

New Type of Paving

394 A specially milled Asbaltic asbestos fiber, utilized in many field test strips of asbestos-asphalt paving and widely used in asbestos-asphalt curbing, is introduced in new *Brochure* AFD-12-A, published by JOHNS-MANVILLE CORP., ASBESTOS FIBRE DIV., MANVILLE RESEARCH CENTER, MANVILLE, N. J.

To Catch an Earlier Mail Plane or Train

395 Postage meters enable any size office to stamp, seal and date a day's mail in just minutes. This speedier handling saves time, money, postage. PITNEY-BOWES, INC., 8576 PACIFIC ST., STAMFORD, CONN., can provide you with full facts.

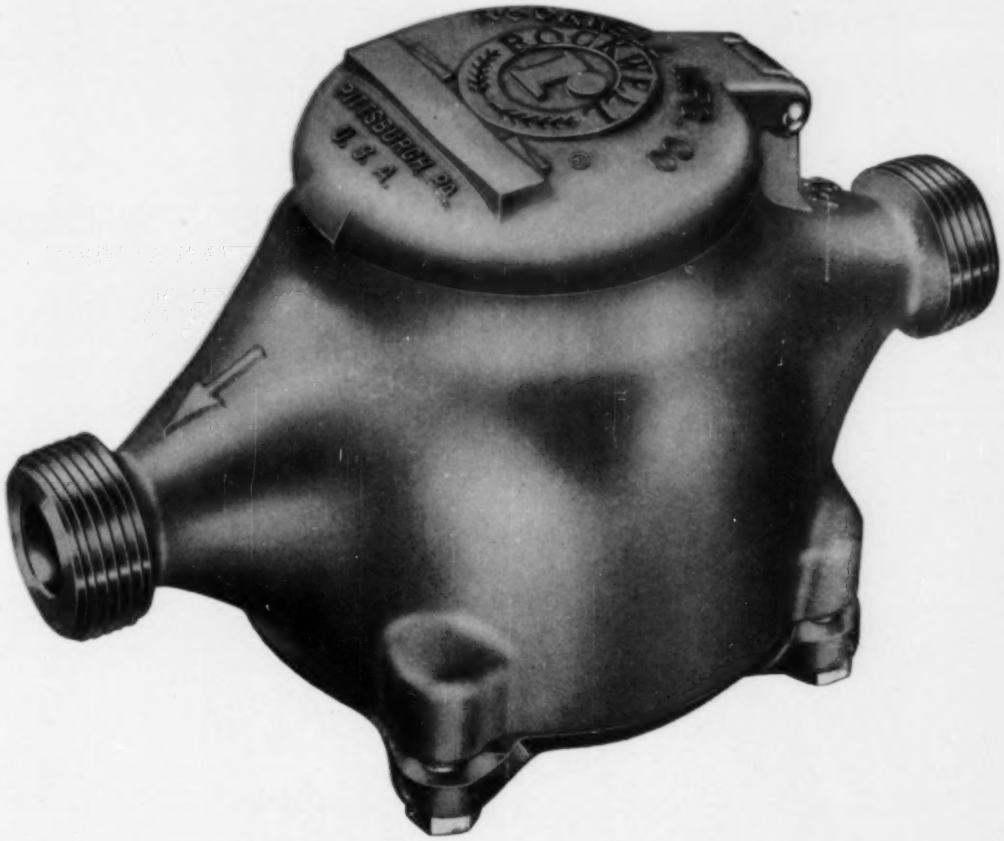
"All-Weather" Parking Meters

396 This is the subject of current literature being offered by DUNCAN PARKING METER, DIV. OF NAUTEC CORP., 835 N. WOOD ST., CHICAGO 22, ILL., manufacturer of a rugged meter that gives low-cost parking control in every season.

(See page 76 for more Bulletins)

Ask the men who use them

(there are many in your area)



Rockwell Sealed Register* "Magnetic" meters

Ask nearby water utilities for *their* experience using Rockwell Sealed Register *magnetic* meters. We'll bank on your getting an enthusiastic testimonial from actual buyers and users.

Hundreds of thousands of these "magnetic" meters are now in service.

*Trade Mark

Please accept this challenge to "ask the men who use them." Write us and we will be glad to send you a list. Rockwell Manufacturing Company, Dept. 159C Pittsburgh 8, Pa. In Canada: Rockwell Manufacturing Company of Canada, Ltd., Box 420, Guelph, Ontario.

Imitated, but never equalled!

SEALED REGISTER* METERS

another fine product by

ROCKWELL

ALLIS-CHALMERS
6
G
HD
6
G
CHALME

WORK AWAY...
WORRY-FREE

...NO ROLLER GREASING EVER!

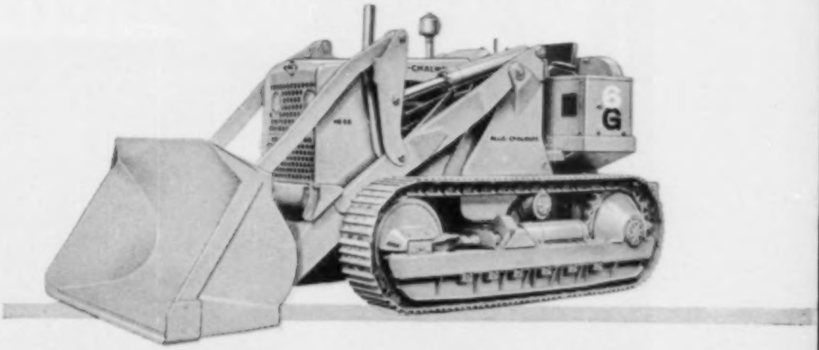
The 72-hp Allis-Chalmers HD-6G is the only 1½-yd tractor shovel with permanently lubricated tapered roller bearing truck wheels, idlers, support rollers—gives you certified protection . . . saves greasing time, materials and money.

The PERMA-SAFE truck wheels, idlers and support rollers in the HD-6G are lubricated at the factory . . . need no further greasing regardless of conditions. PERMA-SAFE design with Positive Seals and tapered roller bearings keep lubricants in . . . dirt and moisture out . . . *for life.*

In addition to timesaving, care-free track lube, the HD-6G also features super pry-out action, highest dumping clearance, fastest reverse and many more big tractor shovel advantages.

Your Allis-Chalmers construction machinery dealer will be glad to put an HD-6G through its paces on your toughest job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

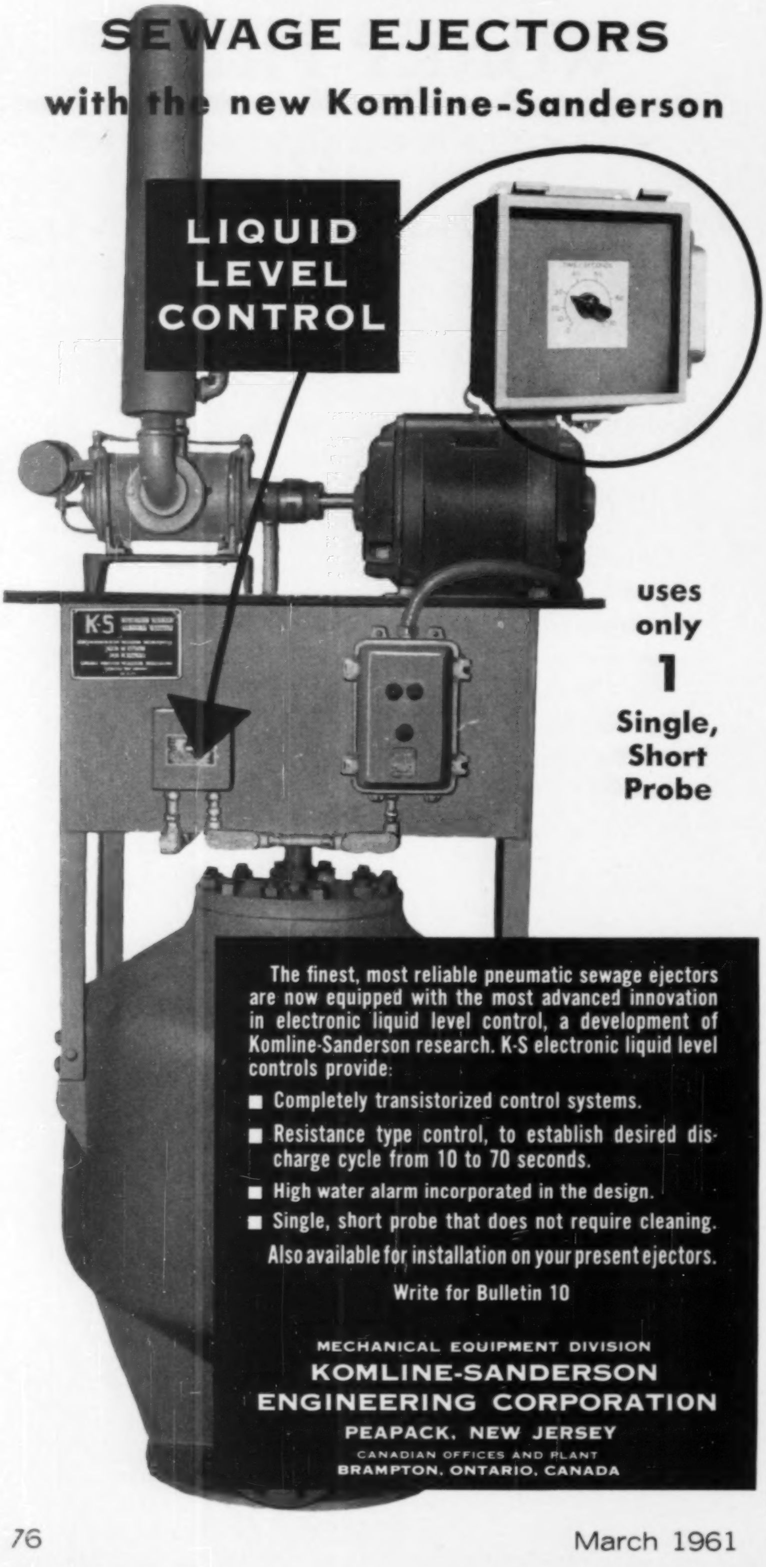
Now available in Persian Orange or Allis-Chalmers Yellow at no extra cost.



move ahead with

ALLIS-CHALMERS

...power for a growing world



K-S

ELECTRONICALLY
CONTROLLED
PNEUMATIC
SEWAGE EJECTORS
with the new Komline-Sanderson

LIQUID
LEVEL
CONTROL

uses
only
1
Single,
Short
Probe

The finest, most reliable pneumatic sewage ejectors are now equipped with the most advanced innovation in electronic liquid level control, a development of Komline-Sanderson research. K-S electronic liquid level controls provide:

- Completely transistorized control systems.
- Resistance type control, to establish desired discharge cycle from 10 to 70 seconds.
- High water alarm incorporated in the design.
- Single, short probe that does not require cleaning.

Also available for installation on your present ejectors.

Write for Bulletin 10

MECHANICAL EQUIPMENT DIVISION
KOMLINE-SANDERSON
ENGINEERING CORPORATION
PEAPACK, NEW JERSEY
CANADIAN OFFICES AND PLANT
BRAMPTON, ONTARIO, CANADA

MONEY SAVING *catalogs*

Write to address given or circle corresponding number on free post card on page 51.

Smokeless Incinerators

397 A smokeless, odorless gas-fired home incinerator has been developed and is being tested to aid communities with the problem of residential refuse removal and disposal. THE MAJESTIC CO., INC., 464 ERIE ST., HUNTINGDON, IND. will furnish literature and details.

New Sewer Cleaning Equipment

398 Three new rodding machines have been introduced by FLEXIBLE INC., 415 S. ZANGS BLVD., DALLAS, TEXAS, to help municipalities ease their sewer cleaning and rodding problems. Catalog literature fully describes the new cam drive UniRodeR, SeweRodeR and Compact SeweRodeR.

Power Street Sweepers

399 These sweepers sweep fast, sweep clean, sweep economically. They're designed for street sweeping, parking lots, airports, sidewalks. The new Wayne *Power Sweeper Brochure* will give full facts. Write WAYNE MFG. CO., 2435 E. LEXINGTON AVE., POMONA, CALIF.

These Tractors

400 . . . trench fast, trench clean, trench at low costs. They are the International 340 and 460 Industrial tractors, powered by either gas or diesel engine and designed for high-production digging and trenching. For details, write INTERNATIONAL HARVESTER, CHICAGO 80, ILL.

Elevated Water Storage Tanks

401 Design, fabrication, erection of dependable gravity pressure water storage facilities for both general service and fire protection is a subject about which CHICAGO BRIDGE & IRON CO., 332 S. MICHIGAN AVE., CHICAGO 4, ILL., is very knowledgeable. So if there's something you'd like to know, why not ask CB&I?

Aluminum Chain Link Fence

402 Here's a fencing material that defies corrosion, eliminates painting, saves on maintenance. Yet it gives all around protection wherever used — for parks, playgrounds, along highways, at municipal plants. ANCHOR FENCE, DEPT. AC-3, 6661 EASTERN AVE., BALTIMORE 24, MD.

Two-Way Radio

403 There's much to know and much that's new about mobile, portable and pocket two-way radio. MOTOROLA COMMUNICATIONS & ELECTRONICS, INC., A SUBSIDIARY OF MOTOROLA INC., 4501 AUGUSTA BLVD., CHICAGO 51, ILL., can supply up-to-date facts in the form of three booklets.

Improved Rotary Compressors

404 DAVEY COMPRESSOR CO., KENT, OHIO, which offers industrial compressors in 2 to 125 hp sizes and standard portable machines in 60 to 600 cfm capacities, announces its new oil-cooled stationary rotary compressors are equipped with a new type oil separator which reduces compressor oil consumption and oil content in air produced by the compressor.

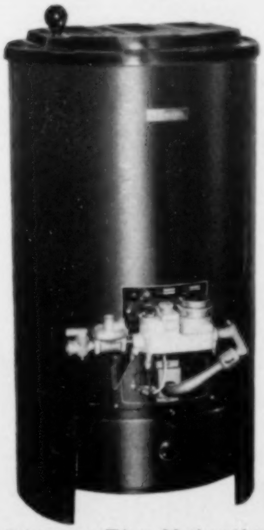
Water Storage Facility

405 *Bulletin* T-22 points out why prestressed concrete should be considered in any tank planning, notes advantages of low structural and service costs, long service life. Write THE PRELOAD CO., INC., 355 LEXINGTON AVE., NEW YORK 17, N. Y.

We found the answer to the community refuse problem!

— says J. R. Sarsfield, Sales Manager
Saskatchewan Power Corporation

THOUSANDS OF THESE MODERN *Majestic* UNITS *are now in use in the Province of* ***SASKATCHEWAN!***



Above: The Majestic Model ESO-1 Smokeless-Odorless Gas Incinerator

It's the GAS-FIRED INDOOR HOME INCINERATOR

The recent development of the smokeless-odorless gas-fired home incinerator offers today's communities the ideal solution to the problems of residential refuse removal and disposal.

The modern incinerator, in multiple residential installations, fully complies with rigid tests conducted by both independent and municipal authorities. It more than meets the high standards of municipal authorities in the fields of maintenance, health and sanitation, and smoke abatement.

It brings the home owner a new source of convenience — and saves him tax money, too, by cutting down the community's expense of collection and disposal of burnable trash and garbage.

At the present time, 15 communities — large and small — are working with the Saskatchewan Power Corporation in the Province of Saskatchewan, Canada, proving it can be done to the satisfaction of all concerned. Your community can do it, too! Write the Majestic Company for complete details.

The Majestic® Co., Inc. 464 Erie Street
Huntington, Ind.

BRIGHTON
BRIGHTON
BRIGHTON
3
FIRE DEPT

ON THE ROLL, five-unit fleet of Mack apparatus leaves station house. Fast starts and fast acceleration are typical of Mack apparatus, a big reason why Macks are favored by so many crack departments.

This town wanted nothing but the best

With an assessed valuation per capita said to be second highest of any fire district in the state, Brighton, N. Y., realized as far back as 1936 it needed the finest fire apparatus.

The decision of the Board of Fire Commissioners through the years: an all-Mack fire-fighting fleet that is the pride and joy of the well-manned Brighton Fire Department.

With a Mack 85-foot aerial and four Mack pumpers . . . 28 paid firemen . . . and 111 volunteer firefighters . . . the Brighton Fire Department is ready and able to handle the most demanding fire-fighting jobs.

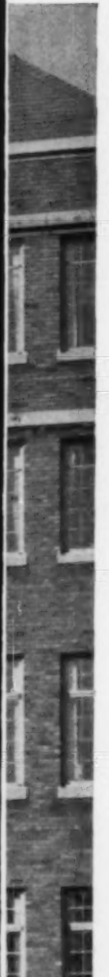
Besides wanting the finest possible fire apparatus made, Brighton chose Macks for another very good reason: close-at-hand Mack parts and service, as everywhere in the United States. No waiting for a company representative . . . no weeks of waiting for delivery of a needed part from a distant city.

There are many additional reasons for Mack fire apparatus superiority—Thermodyne® diesel and gasoline engines to 276 hp . . . standard or automatic transmissions . . . air or hydraulic brakes . . . gear ratios and equipment for exact fire-fighting jobs.

Why not equip your department with the finest apparatus? It's simply a matter of making yours Macks. Mack Fire Apparatus, Allentown, Pennsylvania. Mack Trucks of Canada, Ltd., Toronto, Ontario. 8127

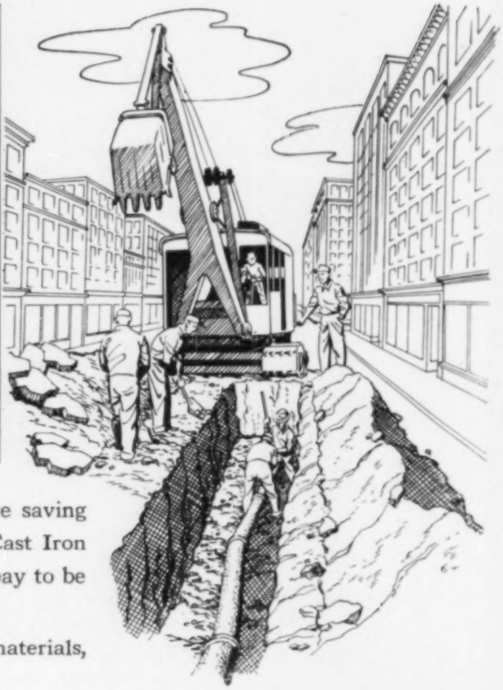
MACK
FIRST NAME FOR
FIRE APPARATUS

COMPLETE LINE OF PUMPERS—500 to 1250 GPM . . . SQUAD AND HOSE WAGONS . . . AERIALS 65′ to 146′ . . . COMBINATION LADDER TRUCKS



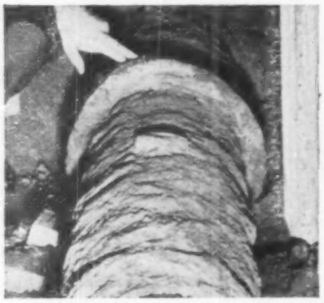
MOCK SCHOOL FIRE brings Mack 85-foot service aerial and 750-gpm triple combination pumper to the scene fast. Chief Carl Guldenschuh directs activities of aerial crew, while pumper driver contacts headquarters on two-way radio. Aerial and pumper are both powered by famous Mack 707C Thermodyne fire apparatus engines.

How Much Would Pipe Replacement Cost Your City?

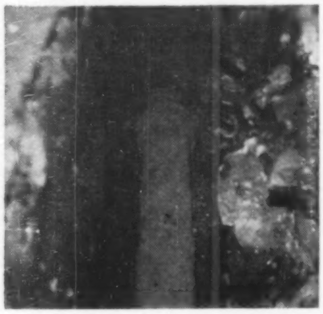


Many communities that thought they were saving money by purchasing cheaper substitutes for Cast Iron Pipe have found to their sorrow that it doesn't pay to be "penny wise and pound foolish."

However glowing the claims of substitute materials, the fact remains that—



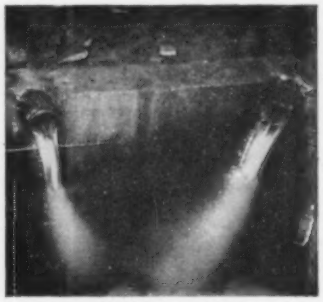
1816 MONTREAL
CANADA
10" Water Main



1828 LYNCHBURG
VIRGINIA
7" Water Main

Only Cast Iron Pipe Has a Record of Service of 100 Years and More in 112 American Cities

No other pipe ever made can match this record of long-lived service. And today's modern Cast Iron Pipe will last even longer. It is stronger, tougher, more uniform in quality than that which has served a century or more. That's why again this year, more miles of underground CAST IRON mains will be installed than all other kinds.



1834 READING
PENN.
4" Water Main

1831 RICHMOND
VIRGINIA
8" Water Main

This advertisement is published in the interests of the Cast Iron Pressure Pipe Industry by......

WOODWARD IRON COMPANY
Since 1882
WOODWARD, ALABAMA

HOW PARLON® COMPOUNDS INCREASE CONCRETE PERFORMANCE

Eliminate Hydration Problems

Parlon treating compounds seal the surface, retain the moisture, for complete reaction and maximum strength.

Offer Immediate Rainfall Protection

Parlon compounds provide rainfall protection within ½ hour after application, developing sufficient hardness and film integrity to keep the fresh concrete from being washed away.

Seal From Within For Long Periods

Parlon solutions are applied at very low solids, penetrate the surface structure of the concrete, and develop an integral seal.

Resist Alkali Damage

Only Parlon chlorinated rubber used with chlorinated resins or other special alkali-proof resins, will withstand alkali indefinitely and thus allow an immediate, permanent bond of adhesives or paint films to the concrete surface.

Eliminate Waxy Film

Where treating compounds are now being used, money savings can result from surface treatment with these Parlon-based products. The Parlon film enables the concrete to cure to a strong slab and sandblasting before applications of paints or joint sealants is not necessary.

Now available from a number of manufacturers are treating compounds based on Parlon, chlorinated rubber made by Hercules. Ask your regular supplier, or write us.

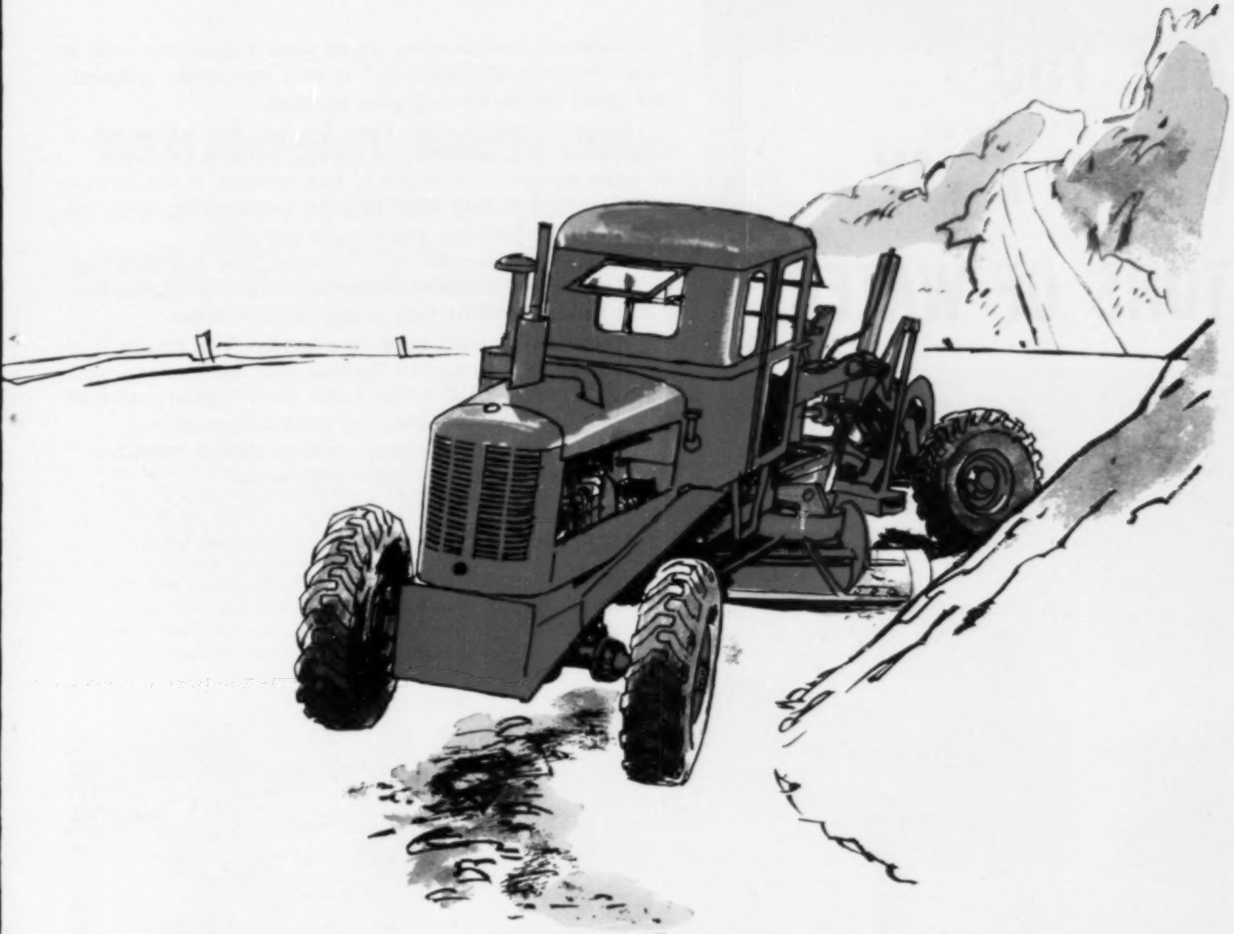
Cellulose Products Department
HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market St., Wilmington 99, Delaware

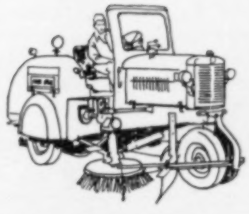
AUSTIN-WESTERN PRODUCTS SAVE TIME AND MONEY

LOOK! EVER SEE A GRADER WORK AROUND A HAIRPIN TURN—AND UP-GRADE, TOO!

That's what this Austin-Western 4-wheel Pacer grader is doing. All-wheel steering controls direction of both front *and* rear wheels for sharp turns. All-wheel steering and all-wheel drive make tough up-grade work possible—make a snap of negotiating hairpin turns; turning in mid-block or deadends with ease. Wide selection of optional attachments ends your need to buy several costly part-time machines for special jobs. All-purpose, year-round Austin-Westerns *save you time and money* grading, ditching, sloping, scarifying, bulldozing, snow plowing, maintaining shoulders, resurfacing. Fully hydraulic; 100% visibility. Maintenance is inexpensive and trouble-free. Ask your nearest Austin-Western distributor to demonstrate these extremely maneuverable graders for you.

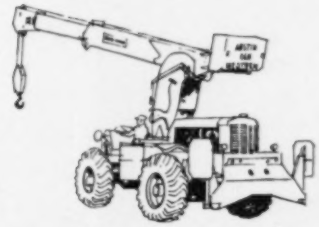
Available in 9 models; 4-wheel Pacers, 6-wheel Supers. Weight classes to 30,000 lb.; power ranges to 165 hp. Write us for literature!





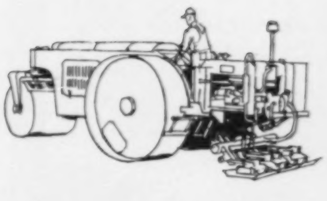
A-W MOTOR SWEEPERS

2 models: 2-yd. Model 40; 4-plus yd. Model 60. Safe, easy front steer; full visibility. Simplified design; broom and hopper in rear.



A-W HYDRAULIC CRANES

5 models. Capacities to 11 tons. Self-propelled and truck or stationary mounting. "Live" hydraulic booms. Variable boom lengths up to 48 ft.



A-W COMPACTION EQUIPMENT

Variable weight tandem and 3-wheel rollers to 14 tons; 3½-6 ton portable tandem; Roller-Compactor; vibratory attachment for most 3-wheel rollers.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

BALDWIN BLH LIMA-HAMILTON

ARE YOU GIVING AWAY TONS OF WATER

. . . just to save a few cents?

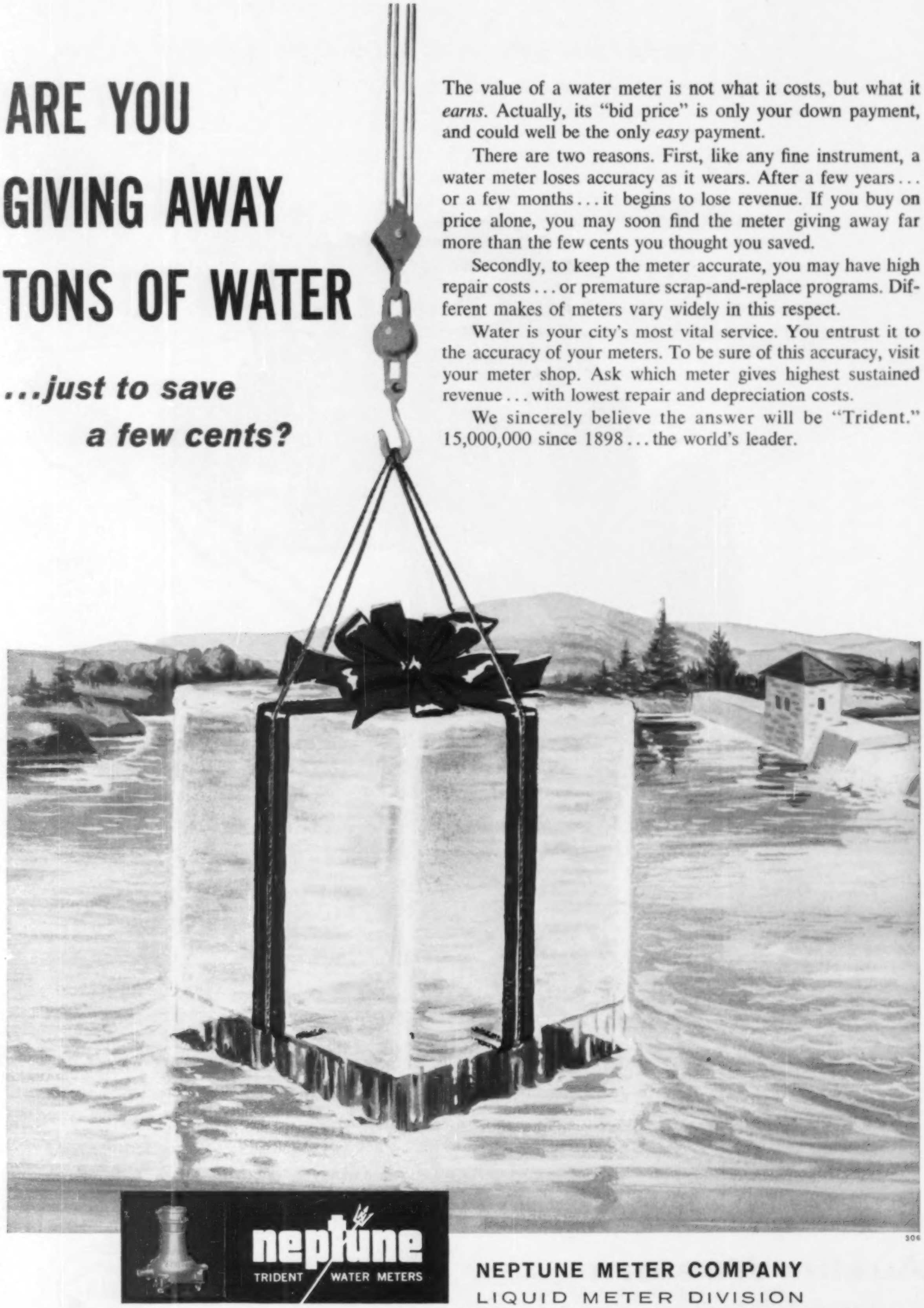
The value of a water meter is not what it costs, but what it *earns*. Actually, its "bid price" is only your down payment, and could well be the only *easy* payment.

There are two reasons. First, like any fine instrument, a water meter loses accuracy as it wears. After a few years . . . or a few months . . . it begins to lose revenue. If you buy on price alone, you may soon find the meter giving away far more than the few cents you thought you saved.

Secondly, to keep the meter accurate, you may have high repair costs . . . or premature scrap-and-replace programs. Different makes of meters vary widely in this respect.

Water is your city's most vital service. You entrust it to the accuracy of your meters. To be sure of this accuracy, visit your meter shop. Ask which meter gives highest sustained revenue . . . with lowest repair and depreciation costs.

We sincerely believe the answer will be "Trident." 15,000,000 since 1898 . . . the world's leader.



NEPTUNE METER COMPANY
LIQUID METER DIVISION

47-25 34th St. Long Island City 1, N. Y. / Neptune Meters, Ltd., 1430 Lakeshore Rd., Toronto 14, Ont. / Offices in Principal Cities

MARCH 1961

The
American City

Universal Metering

. . . adopted in Salisbury, Md., saves 20% to 25% of its water supply previously wasted, and eliminates the need for an enlargement program

By **PHILIP COOPER***

Meters will not cause people to *use* less water, they will just *waste* less. In fact, we anticipate a savings of 20% to 25% as a result of our universal metering program, enough to postpone construction of major facilities for another 5 to 10 years.

This was the basis of our calculations to determine whether we would benefit financially by installing meters on all services, thereby reducing water usage; or constructing additional facilities sufficient to meet the city's requirements based on the existing flat-rate method of charging for water.

Consulting Report Tabled

We began work on the metering program in 1954 by engaging a consulting firm to study the problem and submit recommendations. The firm recommended additional facilities but the proposal was tabled until 1957. By this time the need for additional facilities, or some form of water conservation, was urgent. Further study showed that necessary plant additions and new wells would cost an estimated $1,500,000, some of which would have to be constructed even if universal metering was adopted. Our calculations showed that if metering could postpone such large-scale additions for five years or more, we could then justify such a program from a strictly economic point of view.

Still other major reasons emphasized the wisdom of installing universal metering. For example, the meters permit us to account accurately for each customer's use. They

WATER METER

The installation of the meter consisted of removing the spreader and inserting the meter.

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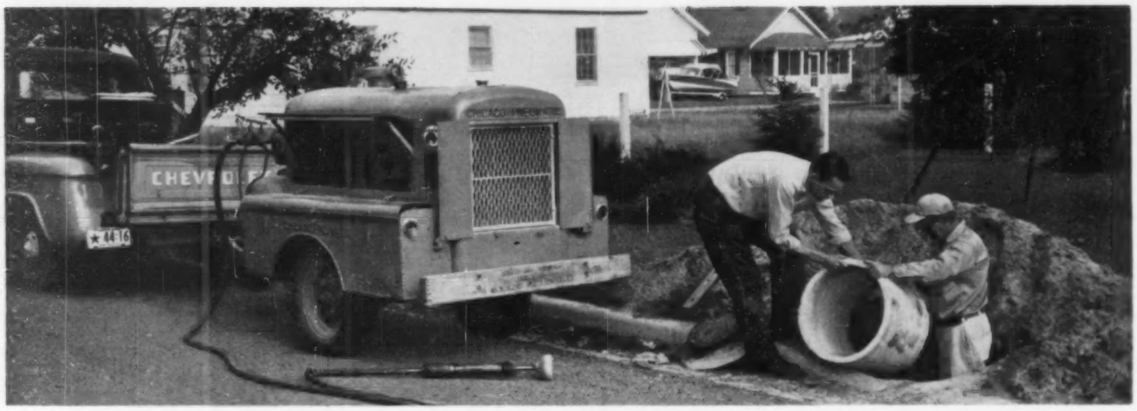
* Mr. Cooper is city engineer and director of public works for Salisbury, Maryland, and as such is responsible for the operation of the water utility.



The compressor crew, equipped with a Chevrolet pickup truck and a Chicago Pneumatic Compressor, installed the meter boxes. A follow-up crew cut the service and inserted a spreader.

also provide us with accurate water-use data throughout the system, making it possible to correct existing weaknesses, and plan intelligently for future system enlargements. Finally, the water meter data will help us establish an equitable rate structure to sustain the maintenance operation and moderate expansion program.

Test

Before going into full-scale installation of meters, we installed 225 test meters in January, 1960, to serve as a guide for revision of our water rate structure.

We read the meters on a quarterly basis and calculated the bills using the proposed-rate-structure method. The customer, however, was charged at the regular flat rate during this trial period. During the first quarter, or in cold weather, these meters showed water billing to be 15% to 20% less when calculated on the metered basis than when figured under the flat-rate schedule. However, at the end of the second quarter water usage mounted to 2½ times the flat-rate figure, reflecting the high seasonal use of water for lawn sprinkling. In the case of 16 homes tested, the water bill was over $30. Several were over $50, and one single-family recorded a water bill of $117 for a three-month period. In the latter case, the regular flat rate was only $11.10 per quarter. These 16 cases indicated the presence of a probable leak in the water system of the homes involved.

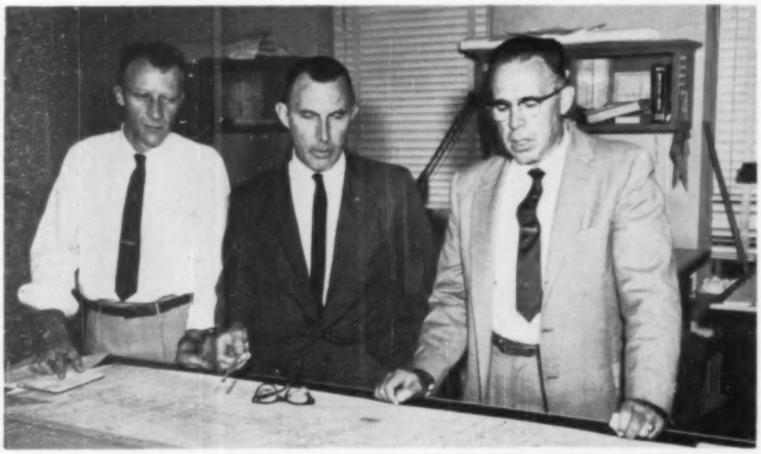
Preparation of the flat-rate services took two years (industrial and commercial establishments have been metered for many years) and actual meter installation took about two months. The ten-man force consisted of a four-man labor-crew, two two-man installation crews, one foreman and one engineering aide.

We decided to install meter boxes at the sidewalk, using pneumatic tools to break up the walk. In our estimates we had figured on breaking only one square of sidewalk, but in actual practice two or more squares often were removed. To correct this we purchased a Clipper concrete saw (after trying one on a rental basis) which permitted us to take out only one-half a square, thus enabling us to save both time and money.

To make the actual installation, our crew cut the individual service on the house side of the curb-stop. The men then installed a Ford riser yoke, with valve inlet and plain outlet with ends fitted for copper tubing. They then connected the copper tubing to existing services, which varied in size and material, by using Style 90 Dresser Couplings with the necessary adapters. They thus eliminated the need for threading old service pipe and found they needed smaller excavations.

A Single Type

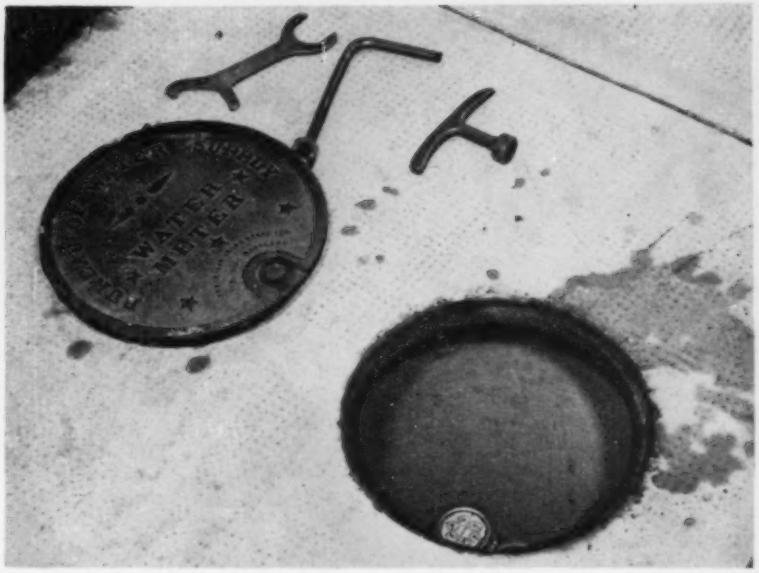
Possibly the most unusual factor of this entire operation was our decision to delay the actual installation of meters until all setups were complete, thereby making it possible to purchase a single type of water meter for our entire city operation. Also it permitted the entire city to begin its metered operation on the same day. This we feel pre-



Author Cooper, flanked by Operating Engineer Robert Brittain (left) and Asst. City Engineer Nelson Messick, check plans for the installation of 4,300 meters.

vented many complaints from persons who might have been placed on a metered basis before the rest of the city. In order to accomplish this our men placed a short pipe-spreader in the riser yoke in lieu of the meter.

From August 4, 1958, to August 24, 1960, this team prepared 4,385 services for meter installation. Regular Water Department crews made 161 setups on new or old services. The main difficulty encountered was the presence of service lines crossing other property, in some cases serving two or more houses and originating from a remote main. These corrections required installing 65 new services by the city maintenance forces.



The completed job, ready to be covered. Two two-men crews installed meters at the rate of 180 per day using only the tools shown here.

180 Meters per Day

The city purchased on low bid, based on specifications prepared by the Engineering Department, 4,300 frost-proof cast iron base ⅝ inch Neptune Trident meters. Two crews, of two men each, installed these meters at the rate of 180 per day. Work was completed in November 1960 and the new metered rate schedule went into effect January 1, 1961.

The total cost of installing the meter setups was $194,050.82, or $44.25 per setup, excluding the cost of the meter. This amounted to nine cents less per unit than our original estimate which had been made early in 1958.

To pay for the work, the City Council authorized two bond issues, one of approximately $200,000 to pay for the initial installation and the other of approximately $100,000 to purchase the meters.

The quarterly water rate, amounting to $5.00 minimum and 33 cents per thousand gallons for the first 300,000 gallons used, will cover the cost of operating the Water Division and amortize the cost.

Repair Shop

Now that the meters are in place, our next item of business consists of setting up a meter repair and service shop and establishing a program whereby we will be able to test and repair meters regularly.

While little attention need be given to the meters in the next several years, we expect to set up the shop by the end of 1961 and establish a regular maintenance schedule right from the beginning.

Assistant City Engineer Nelson Messick supervised the meter installation program; Robert Brittain, Operations Engineer, is responsible for operating the department's Water Division. ◄◄

Court Okays Billboard Seizure as a Traffic Hazard

That billboards and other outdoor advertising signs can be a traffic danger was held by the Appellate Division of the New York Supreme Court, 3rd Department, in the case of *Schulman v. People,* 11A.D. 2nd, July 1960.

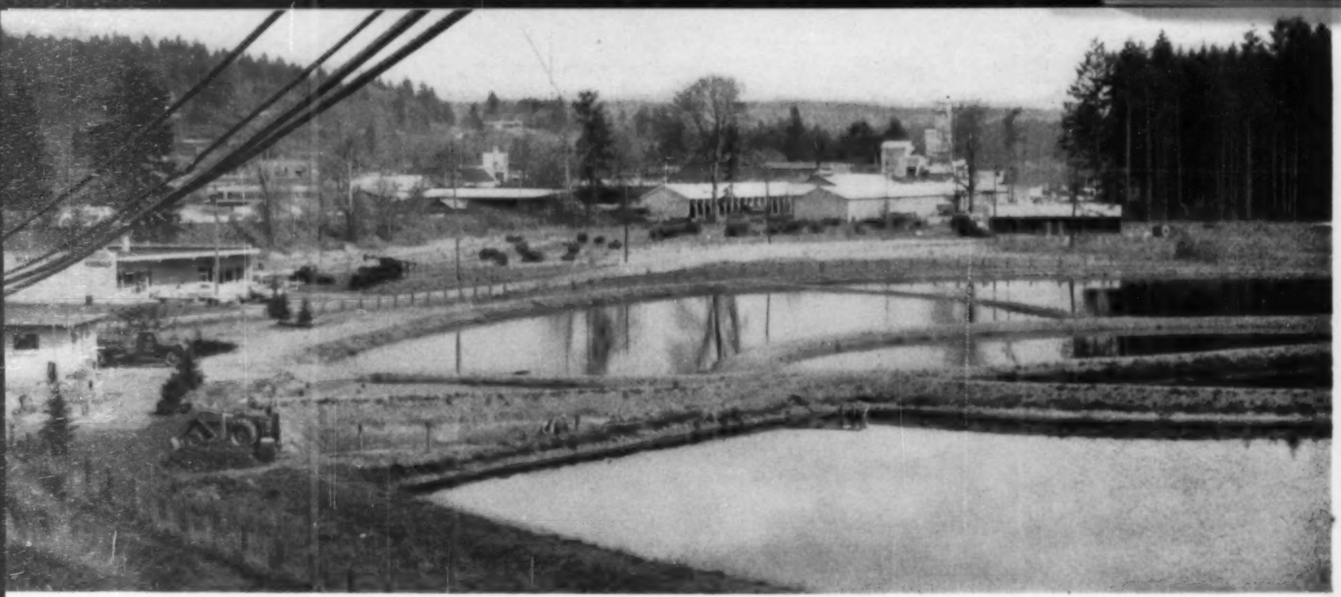
The Highway Law of New York authorizes the Superintendent of Public Works to "acquire by appropriation any and all property" necessary "to improve safety conditions on the state highway system." Acting under this authority the superintendent sought to acquire an easement over the land of Schulman prohibiting him from maintaining outdoor advertising on his private property along the highway. The state's contention was that this was an exercise of the power of eminent domain for a public purpose, viz. highway safety. The landowner claimed that the elimination of outdoor advertising and displays would not increase the safety of the highway.

The court, by a decision of four to one, refused to interfere with the superintendent's judgment concerning the danger of outdoor advertising signs and dismissed Schulman's complaint.

The dissenting justice thought that the statute under which the Superintendent of Public Works acted was not broad enough to include his power to act in this particular case.

The four justices thought that the superintendent's power to abate the traffic danger from outdoor advertising along the highway was analagous to his power under the statute to eliminate dangerous curves, sight-blocks by buildings or trees, glaring lights, signs with moving parts, or other kinds of traffic dangers on adjoining private land. The only difference between the four and the one was thus one of interpretation of the scope of the particular statute affecting the superintendent's power. There was no difference expressed over the danger of outdoor advertising through the distraction of the attention of drivers.

The opinion recalls the decision in *Perlmutter v. Greene,* 259 N. Y., 327 (1932), where the Court of Appeals upheld a previous Superintendent of Public Works in planting trees on state land in order to block the view of a dangerous advertising sign. ◄◄



By the end of the first year's operation the pond had remained so free of odor that several business properties were built on land adjacent to it.

Sewage Lagoon With a Difference

Anaerobic-aerobic stabilization pond in Redmond, Wash., proves its value over straight aerobic type

By **W. A. BERSCHAUER***

The advantages of the anaerobic-aerobic or combined type lagoons will undoubtedly start a trend toward this type of lagoon treatment. We already can see it in Australia where a number of such stabilization ponds have been operating successfully for over ten years.

These advantages over the conventional aerobic lagoon include:

- **Comparable BOD and coliform reductions using one-third the land area.**
- **Odor-free operation under proper control, making possible a site location in the vicinity of inhabited areas.**
- **Adaptability to climatic variances, made possible by control of depth and detention times, to maintain a constant efficiency throughout the year.**
- **Localization of grease and other floating materials for easy removal if necessary.**
- **Concentration of sludge in a small area, thereby simplifying removal operations.**

The Redmond, Wash., lagoon, built on an experimental basis and placed into service in 1957, represents a coordinated effort on the part of the city, the consulting engineers, and various state agencies. It serves as a means of sewage disposal until the time that the area chooses to become part of the Seattle Metro System, though this development is unlikely. Redmond is outside the present Metro boundaries and the pond has proven capable of handling several times Redmond's present population.

Design Data

It was proposed by Carey & Kramer, consulting engineers of Seattle, and designed by David Livingston, who secured and studied extensively anaerobic-aerobic performance data from Australia.

Natural land contours dictated use of the elliptical shape. The unusual multi-cell arrangement not only provides flexibility for experimental projects but reduces wave action on the pond embankments, which are made of a soil subject to sloughing. The circular two-cell area in the center is the anaerobic section, the aerobic area, cut radially into six cells plus two small pie-shaped effluent filters, occupies the surrounding space. A dike also cuts across the entire lagoon, allowing each half to operate as a separate unit or both halves to operate in parallel.

Each central anaerobic cell has a design depth of five-feet and a surface area of 0.33 acres. The aerobic cells are each three feet deep and 0.89 acres in area. Total water surface area amounts to 6.0 acres and the pond area, with dikes, is 7.3 acres. The pond handles the raw sanitary sewage of 400 persons per acre per day.

The influent structure contains a grit channel, barminutor and Parshall flume for flow measurement. By means of a series of draw-off pipes, waste water travels the design path through half the lagoon. A V-notch weir measures the flow

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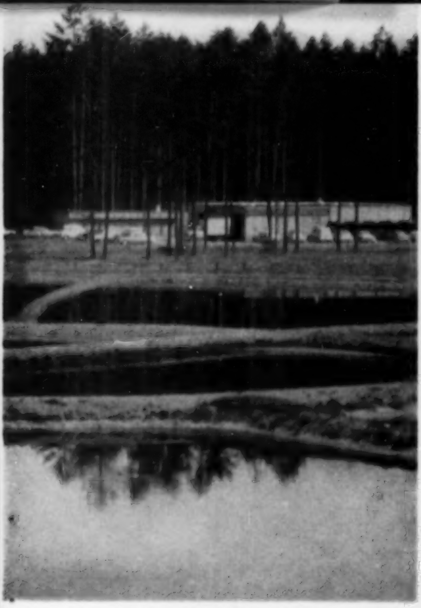
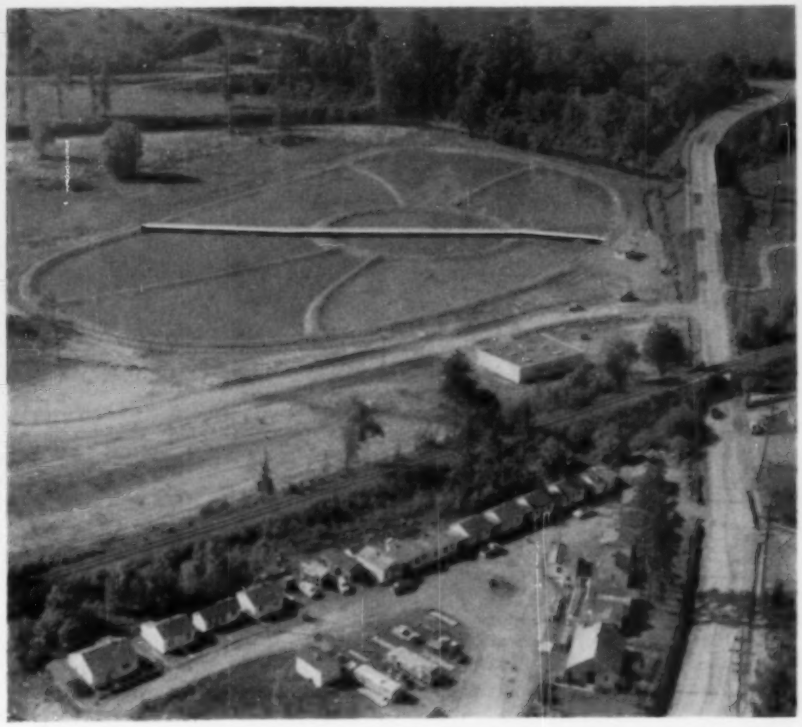
* Mr. Berschauer conducted a comprehensive year-long study of the Redmond lagoon while working toward his Master of Science degree. His report is entitled "Research and Investigation on a Multi-Cell Stabilization Pond," Master of Science thesis, University of Washington Library, Seattle 5. He is a public health engineer with the Sanitation Engineering Division, Washington State Health Department. This article was taken from his thesis.





A dike through the center of the lagoon allows each half to operate independently. Raw sewage enters a center anaerobic cell, then travels through three outer aerobic cells.

of sewage passing through both sections of the lagoon.

Raw sewage enters the center anaerobic cell and then travels through each of the three outer aerobic cells. The final effluent flows into two small pie-shaped sand filters equipped with perforated drain pipes.

Performance

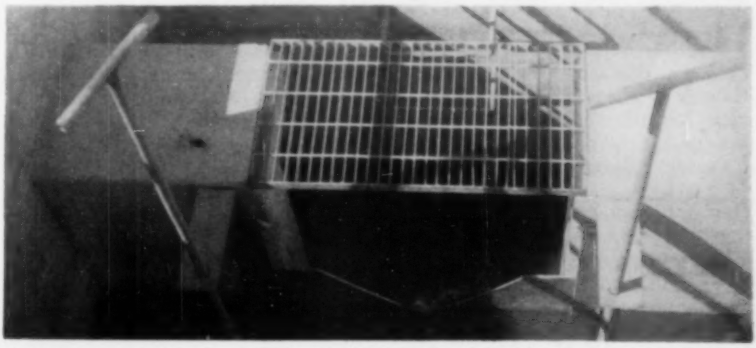
The anaerobic cell efficiently receives BOD loadings as high as 555 pounds per acre per day. This figure could be increased, for performance reports on Australian lagoons indicate a maximum load of 2,000 pounds per acre per day can be applied to the anaerobic section for detention times of two to five days.

The first aerobic cell, receiving effluent from the anaerobic section, reached loadings of 69 pounds per acre per day in winter to 78 pounds per acre per day in summer. At these loadings the 0.89-acre cells showed some difficulty in meeting the oxygen demand during prolonged periods of cloudy days. While the second and third aerobic cells accomplished little as far as BOD removal is concerned, they did act as depletion cells for algae and were also active in the reduction of coliform bacteria. Coliform reductions in excess of 99.9% were experienced.

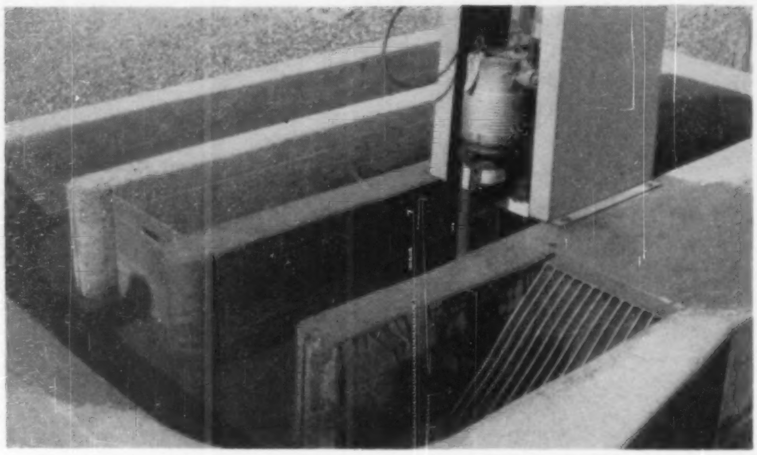
The relationship between depth and detention time is important, and in order to attain maximum year-round efficiency, each type of cell should have independently operated depth controls.

In the anaerobic section, depth affects detention time only, but this is important. At both 2½- and 4-foot depths, BOD reduction averaged 70% for a 2½-day detention period. As detention time increased, BOD reduction decreased to 56% for five days and 46% for eight days. BOD reduction averaged 65% at two to four days of detention time.

In the aerobic section, depth has a marked influence; lower depths give a better BOD reduction for a given detention period. The Redmond study shows that with proper depth control, BOD reductions can be maintained constant in the aero-



All sewage passing through the pond flows through this effluent structure where a V-notch weir measures the volume of the flow.



Sewage entering the plant passes through a barminutor or a by-pass channel, then through a Parshall flume which measures the flow.

bic section throughout seasonal changes in Washington. Optimum depths for the Redmond pond were found to be three feet in spring and summer (for weed control) and two to 2½ feet in fall and winter (for better mixing and conservation of light energy).

In the aerobic cells, variances in detention time from ten days at 2½-foot depth in colder months to 20 days at 3¼-foot depth in warmer months proved necessary to give a year-round 90-95% overall reduction in BOD.

Other Findings

The year-long experiments showed that proper control of anaerobic-aerobic pond eliminates odors to such an extent that residences may be located on adjacent land, the only exception being possibly areas which experience strong prevailing cross winds. Here a few hundred feet of open space in the direction of the wind might be desirable as a safety factor.

The Redmond anaerobic section was almost completely odor-free during the winter months and for the majority of the time during spring and early summer. One precaution is to watch the floating solids along the dikes and mix them for settling; otherwise foul odors can develop. Wind action is a necessary requirement for efficient treatment.

Nutrient reduction is obtained almost exclusively in the anaerobic section. Reduction in total nitrogen averaged 60%; phosphates reduction averaged 25%. Depth and detention had a minor influence on both.

A clear, low algae effluent can be obtained by providing depths in excess of four feet in a final cell, the algae being consumed by rotifers and crustaceans.

The test results included two items of special interest. First, contrary to what might be expected, BOD reduction in the anaerobic section increased with decreasing detention time. Second was the ability of the Redmond pond to operate in somewhat less than "plenty of sunshine." During the first six months of the study, only 24% of the days were clear and sunny, ranging from 10% in January to 33% in June. Average air temperatures varied from 32°F (with some ice on the aerobic cells) to 61°F. However, by regulating depth and detention times, a constant BOD reduction was maintained.

Based on the Redmond experiments, the ideal anaerobic-aerobic stabilization pond would have three cells: anaerobic, aerobic, and a polishing or algal depletion cell, each capable of independent control.

The first cell would be the deeper anaerobic section, receiving raw sewage well into the cell area. Depth control would be used to maintain optimum detention time The withdrawal point should be up from the bottom and below the surface to prevent solids from being carried over.

Large Cell

A large cell for the aerobic section is preferable over the series of small cells in order to obtain the greatest amount of continuous surface area. The volume could be utilized for BOD reduction. The draw-off pipe should be well into the cell to give complete dispersion of sewage yet minimize the possibility of short-circuiting to the final cell. Again, depth would be controlled for maximum efficiency.

The final and smallest section would be a deep polishing cell for the removal of algae. ◄◄

Suburbia No Social Blight

Suburbia should not be blamed for America's social ills, Prof. Amos Hawley of the University of Michigan told the Michigan Municipal League recently.

Professor Hawley has no patience with "latter-day moralists" who view suburban life as a sign of national decadence.

The mass-built suburb is colorful, he explained, if not pretty. Certainly it is no more lacking in individual expression than the brown-stone front, the row house, or the narrow-fronted two-story houses with which our cities were filled in the early decades of this century. The conformity of the manicured lawn, of the charcoal grill in the back yard, and of the do-it-yourself movement point at least to constructive uses of leisure time.

Where critics view these trends as symptoms of a classless society, they ignore the great proliferation of civic theatres and community orchestras, and the enormous increases in book sales of recent years.

"Most critics of the suburbs, moreover, are unaware of the great diversity in suburban life. They know only the Park Forests and the Levittowns. The Inksters, Wyandottes, Mount Morris and the many other working man's suburbs escape their notice.

"The real problems of the suburbs are earthy, technical and immediate," Hawley continued. "They include the increased demand for sewers, water, and other direct public services—at costs, in Michigan, ranging from five to 200% above those of central cities." ◄◄

Proper cost accounting can tell the engineer which types of equipment give the best service and when to replace machinery.

All repair work is chargeable to the particular equipment.

Cost Accounting

. . . for the municipal engineer will permit him to set performance standards and determine operating efficiency

By **PAT THOMSON***

It is disconcerting to find that the average small city in this state does not care about cost accounting. Councils nonchalantly divert street funds to other purposes; then complain bitterly of insufficient money for street maintenance. In the city in which I served, we had no way of telling what our own forces were costing us in service. The employees themselves resisted any attempt to establish cost accounting.

Why should even the smallest town practice cost accounting? First it has an important psychological impact upon the personnel doing the force account work. Construction, maintenance, and shop supervisors, knowing that their performance is being evaluated, will be on the lookout for inefficiency and will make every effort to correct the situation. Sloppy work is harder to hide, which may be one reason why some people resist cost accounting.

Secondly, cost accounting is definitely the language of engineering. It serves as the primary method of communicating construction and maintenance data to subordinate engineers, supervisors, councils and boards of commissioners.

A Minimum Knowledge

It is important that every city engineer should have a minimum knowledge of the subject so as to establish a logical, systematic system of accounting for his operation and to interpret the data received. Cost accounting will answer the question of whether or not his operation is logical and efficient.

Finally, it allows the administrative engineer to hold certain managerial personnel responsible for all costs that they control. This is important, since costs are controlled only by persons making proper decisions, based on cost data, to decrease operational expense and increase efficiency.

Cost accounting, as it applies to a public-works operation, requires first the establishment of an equipment rental rate for hourly, daily, or monthly use. The rate should cover maintenance and repair of the machine, all overhead costs, and depreciation.

Since income-tax factors do not concern government agencies, the depreciation item is not the same as used by private business. Depreciation's primary function is to spread the cost of the asset over its useful life, and to accumulate a reserve solely for the replacement of the equipment asset when used up. It eliminates the probability of ruining a construction or maintenance budget for an entire season by the

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* Mr. Thomson is County Engineer for Douglas County, Wash. He also served on a city council for several years.

A good cost accounting system will disclose the cost per mile of street maintained and the cost per hour of operation for equipment such as this.

bulk purchase of needed equipment without having reserve funds set aside.

For simplicity, the engineer can calculate depreciation on a straight-line basis and be sufficiently accurate. For example, a $23,000 motor grader with a $4,000 forecast salvage value after ten years would have a depreciation value of $19,000, or $1,900 for each year of its usable life.

Depreciation life is not merely a matter of usable time, for even though the equipment may still be in good operating order, technologically it may be out of date, making it more economical to replace it with a new machine.

Another basic requirement is a stores account, and this necessitates carrying a running inventory of all parts, supplies and stores. This system picks up inaccuracies in and lack of reporting as well as other faults.

Workable Systems

Regardless of the system used, it will only be as accurate as the reporting of your field units. Thus, proper instruction to all persons concerned is paramount. For example:

- **For each day that an equipment item works, debit its rental rate against the proper maintenance or construction function and credit the equipment account.**
- **For any supplies purchased, voucher them against the proper revolving-fund supplies account as a debit.**
- **For supplies used on a machine, debit them against the rental and credit this amount to the proper supplies account.**
- **For repair-parts purchase, voucher them against the maintenance and operation fund as a debit and debit this against the rental, also credit to the maintenance and operation account when used on the machine.**

Theoretically, a machine ends the year with the exact amount of depreciation reserve to its credit only when:

- **no more supplies or parts were purchased than anticipated in the rental so there would be no inventory.**
- **all overhead costs were as expected. This is seldom true, so rental rates have to be adjusted periodically.**

The Douglas County engineering department evaluates rental rates each six months on January and July 1st and adjusts them accordingly. The depreciation reserve fund is kept intact and when replacements are needed the money is available.

Purchases of such items as culvert pipe, crushed rock, bridge material, and other materials held as supplies are debited to the stores account. When requisitioned against a job, they then become a debit expense against that project and are entered as a credit to the stores account. At the end of any one year, in all accounts, the credits plus the inventory on hand should balance the purchases. If not, there is an error in reporting.

Inventory is a problem, especially for such items as gasoline. We balance gasoline on a monthly basis, giving each shop a 50-gallon spillage allowance. If inventory plus usage is out of line more than that, the supervisor has some explaining to do.

There is little opportunity for juggling. The purchase invoices come to the office and shop charge-outs are made by the station attendant, who "sticks" the tank at the required date. Neither he nor the equipment operators have records of the amount purchased. This system eliminates gas disappearing in five-gallon cans.

Inventory

The question of how much inventory should be maintained can best be answered by experience. Too great an inventory means costly storage space and money tied up in spare parts. Too little inventory can mean deadlined equipment at a time when it is needed the most. Generally, a high inventory turnover is a good indication that inventory is being handled properly.

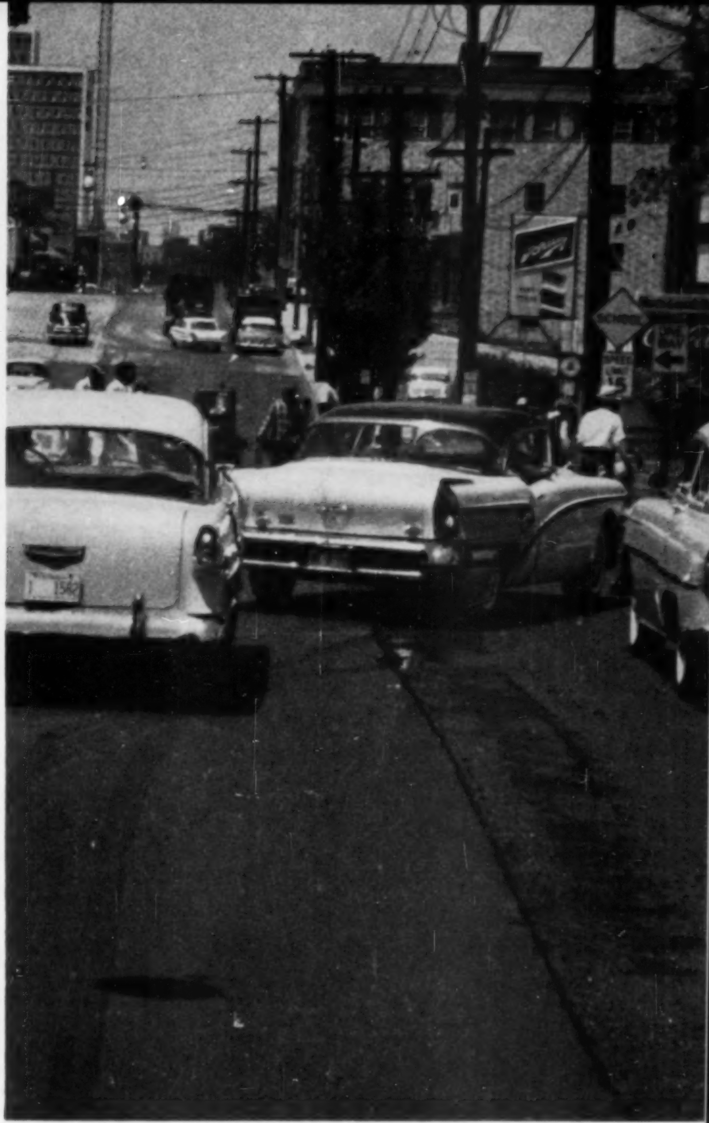
All our disbursements of cash are done on a voucher system, with supporting invoices, receipts and statements forming the evidence of why payment is made. We number vouchers consecutively per account, with warrants numbered accordingly. This provides a ready check system.

Over a period of years, proper cost accounting provides a record of performances. The administrative engineer can use these to make cost estimates, the backbone of his control system. Also, the performance data so gathered, tempered with logical additions reflected in wage increases, better construction methods and more capable personnel, allow the establishment of pars or goals of accomplishment for managerial or supervisory personnel. The responsible party should be required to explain any fluctuation over a high level of efficiency.

Cost accounting does have limitations that need to be recognized. With the accounting of every minute item, the system can become so unwieldy and impractical that the engineer throws out the entire operation. A system of cross accounts can be no more detailed than the field reporting warrants. Our system has been a model for several counties and one accountant handles over a million dollars yearly. Practicality is the keynote.

The greatest battle any city, county or state administrator faces today is that of fitting rising construction and maintenance costs into relatively stable budgets. Cost accounting will help win this battle. ◄◄

The addition of asbestos fiber to the asphalt mix permitted rolling directly behind the paver without pulling up or tearing.



Cars drove over the test strip between the paver and roller without damaging the pavement. Slight marring is only minor surface distress.

Asbestos Asphalt in Atlanta

By **RAY A. NIXON**
Chief of Construction
and **DAN JOHNSON**
Maintenance Engineer

Asphalt paving that incorporates asbestos fiber in the design mix is undergoing tests in Atlanta, Ga. These tests are part of a continuous research and field-testing program designed to improve road conditions within the city, decrease maintenance costs, and extend service life of streets and equipment. While approximately 34 asbestos-asphalt strips of varying design mix, length, and intended service have been laid in the United States and Canada, this is the first time our department has worked with the material.

Representatives of the Asbestos Fiber Division of Johns-Manville worked with our engineering staff, supplying data and test results showing performance of asbestos-asphalt strips in service up to 40 years. With this supporting data we felt justified in laying test strips of our own to determine how the material would stand up under Atlanta's traffic and weather conditions.

We are looking primarily for additional toughness, weather resistance, flexural strength and long-term stability at high ambient temperatures and severe traffic conditions. Laboratory tests reported by J. H. Keitzman of the Johns-Manville Research Center at the 39th annual meeting of the Highway Research Board indicate that the addition of 2 to 3% asbestos fiber to an asphalt mix will achieve these results.

We laid the test strips at two locations: one on busy Kenilworth Drive, S. W., and the other on Courtland Street. On the latter street the test section begins at the end of an expressway "off ramp." Heavy traffic at this spot made it impossible to keep vehicles off the pavement while applying the test strip. This proved to be an unexpected test of performance and speed in putting a street back into service.

For control purposes, we laid three strips along Courtland Street—a 16-foot-wide, 2,000-foot long strip of asbestos asphalt in the center of the roadway and an 8-foot wide conventional asphalt pavement on either side. This is a two-way street, subjecting both control and test strips to similar traffic conditions. We plan to keep close watch on the roadway for about three years to determine performance.

The test surface includes a one-inch binder or leveling course topped by a one-inch surface course. City personnel and equipment performed all mixing and laying. We used a 2,000-pound-capacity pug mill, adding the asbestos fiber directly into the pug mill by hand.

The mix consisted of 882 pounds coarse aggregate, 50 pounds mineral filler, 50 pounds asbestos fiber (7M06), 148 pounds asphalt and 870 pounds of sand. On a percentage basis this represents 2.5% asbestos fiber and 7.4% asphalt by weight. Normally this quantity of asphalt is too great for our particular mix, but tests with asbestos asphalt indicate it is not detrimental to increase asphalt content to some extent—in fact it is desirable. Some chemical action takes place and this action, coupled with the high surface area of the fiber, results in a combined mechanical and chemical retention of the so-called excess asphalt. This apparently prevents flushing of the additional asphalt to the surface, forming an undesirable "slick."

Paving equipment consisted of a conventional Blaw-Knox paver and two rollers. A ten-ton three-wheel roller performed initial compaction followed by a five-ton two-wheel tandem machine for final compaction. We did not change laying temperature from that normally used, which is approximately 300°F. The only variation from normal paving procedure consisted of raising the screed height slightly. The addition of asbestos gives a fluffier mix requiring a thicker application by the paver to achieve the desired final compacted thickness.

While we must await more exhaustive performance and laboratory tests before drawing final conclusions, we did notice certain immediate benefits. Rolling of the asbestos asphalt can proceed almost immediately after the mix leaves the paver, thus eliminating the 10 to 15 minute wait usually required for the mix to cool on the street. Rolling was accomplished without perceptible blistering, pulling up, or tearing.

Another fact about asbestos asphalt immediately became apparent. The operator of the ten-ton roller left it parked for approximately ten minutes on a grade of about 20° while the mix was still hot. This produced no evident distress to the pavement. As a result we allowed traffic on the Courtland Street pavement within 20 minutes after initial rolling rather than holding off a minimum of one hour as normally practiced. Cars drove on the newly-laid pavements between the roller and paver without damaging the paving other than surface marking.

The asbestos asphalt appears to roll tighter with less aggregate separation and the added asphalt provides a more dense and uniformly black surface course.

Our experience indicates that the addition of asbestos fibers presents no special problems. On the basis of test work already in progress plus more scheduled to be done, the usefulness of this new development to specific applications in street and highway paving will soon be demonstrated and documented. ◂◂

Lions Donate $ $ $ to Devour Insects

The Lions Club of Naperville, Ill., has donated $650 to the city to help defray the costs of mosquito abatement. This amount represented half the cost of a Curtis Automotive Devices Dyna-Fog machine which the city purchased last July and used for a portion of the season.

In previous years the city has rented a smaller model of this unit for use in parks and other public places. Beginning this year the program will be extended to the breeding and larvicide levels, thanks to the convenience of a model large enough to make these operations economical. Continuing the experiments which were started in late 1960, the city will fog the entire incorporated area from the streets and alleys.

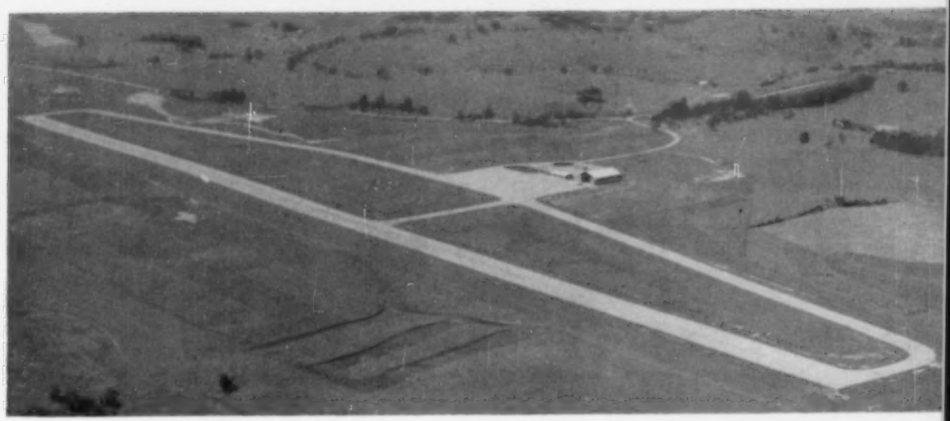
The insecticide, a mixture of DDT and several additives, is designed not only for killing action but also for growth inhibition. Last year's experiments indicate that dilution with 15 parts of water provides satisfactory results and is less objectionable than oil-base dilution.

Spraying will take place in the late afternoon and early evening when the mosquito population reaches an undesirable level and when weather conditions permit. To cover the largest possible area effectively, a gentle breeze should waft the fog around the houses and through the trees. The public will receive prior notice of fogging through the various news media in the city.

William G. Zaininger
Mayor
Naperville, Ill.

The Lions' Club donated one half the purchase price of this fogger.

Prevailing winds follow this runway 93% of the time.



How three counties and five municipalities joined to build . . .

An Area-Service Airport

By **C. V. JACKSON**
Mayor
Pulaski, Va.

A few years before World War II Pulaski, Va., developed, a few miles from town, two turfed runways known as Loving Field which housed a government communication station for the guidance of aircraft. It had been obvious for a number of years that Loving Field would not meet the needs of an expanded aviation age and, following a look around the countryside, the Town of Pulaski and the City of Radford decided to examine seriously the possibility of a commercial airport for the area. This resulted in an engineering recommendation for a new field to be located on Route 100 some two miles north of Dublin. The FAA immediately gave its approval.

To facilitate construction the New River Valley Airport Commission was formed on May 7, 1957, with membership from the political subdivisions as follows: Giles County, Montgomery County and Pulaski County; the City of Radford; the Towns of Christiansburg, Dublin, Pearisburg and Pulaski.

The federal government, through the FAA, shared half the cost of most items of expense, but not all. The local share was divided among the various political subdivisions enumerated above; the formula worked out by the area representatives was based upon population, nearness to the new field, ability to pay, etc. It should be noted that Pulaski County, in which the field is located, and the towns of Pulaski and Dublin together are bearing 51.5% of the cost not participated in by the federal government.

Facilities

As to the physical facilities, 380 acres of land were acquired at a cost of about $142,000, and on this site there has been constructed a paved runway, 4,800 feet in length and 100 feet wide as well as paved parallel taxiways 50 feet in width. Also a 250x500-foot apron has been paved, all of the paving being asphalt. To date the State of Virginia, through the Division of Aeronautics, has invested $50,000 in this splendid new airport, the federal government has spent or obligated itself for $392,000 and $466,000 of local funds have been spent or obligated. The hangar, administration building, water and sewer system, additional parking facilities, etc., are now being constructed at a cost of some $70,000 without any federal participation. The only construction phase remaining is the field lighting which is scheduled for installation in the summer of 1961, with the political subdivisions having already obligated themselves to finance the lighting project during the 1961-62 fiscal year.

Airline pilots have been lavish in their praise of this new field because of highly favorable weather conditions and the complete lack of obstructions on both ends of the runway, which enjoys prevailing winds 93% of the time. There is a graded and turfed over-run area about 500 feet in length on both ends of the runway, and the terrain makes it quite feasible to extend the runway to 10,000 feet with only a minimum of grading if a runway of such length should ever be needed. Pulaski County has already zoned the airport area for a 10,000-foot runway. The Airport Commission already owns sufficient land to afford minimum clear zones on the approaches for at least 6,000 feet of runway.

The New River Valley Airport was built with airline service in mind. Petition was made to the CAB to have Piedmont Airlines serve the new field. The Airport Commission is presently involved in an area suit to determine what additional areas will be served by Piedmont and it is anticipated that all details will be resolved in time for Piedmont to begin serving the new field with at least two flights per day each way by the mid-summer of 1961 at the latest.

Conference Room

The administration building will include a conference room which will be reserved for business people who want to transact business on the field rather than have to go to nearby industries or concerns to gather around a conference table. Also, this administration building will feature a private room in which airline and business plane pilots can relax while waiting on the field. ◄◄

DUNCAN
FINE O'METER

An overparker pays her traffic fine quickly, conveniently and almost pleasantly.

Tight Parking Enforcement

. . . drives parking "hogs" out of downtown area

By **EARL F. DUFF,** Captain
Traffic Department, Huntington, W. Va.

Parking meters are used intensively in the 16 city blocks of the Huntington, W. Va., core area. They are about half Duncan Miller and half Karpark meters. Within this area the cost of parking has been increased from five cents per hour to ten cents per hour. This move was made to bring street parking cost more in line with off-street parking cost. But this is not enough to discourage people from using the street meters.

The rate now recommended is twenty cents per hour to be levied at the rate of five cents per 15-minute period. Also, covering this area an ordinance was passed prohibiting the parking of a vehicle for longer than the period of time designated by the individual meter. For example, within this area there are certain spaces designated as thirty-minute zones generally located at strategic points and a few 15-minute meters are also used. All other meters carry the maximum time allowed (two hours) but all these meters are regulated by the ordinance which prohibits meter feeding or buying time beyond the initial period indicated by that particular meter.

Enforcement

Enforcement of this ordinance required that the officers on these territories chalk the tires of vehicles pulling into the curb. In order to accomplish this these sixteen blocks of meters were divided into four blocks each. This materially reduced the number of meters assigned to each man so that he could check more frequently the meters for which he is responsible. This move has led to a higher turnover at each parking space.

At the old rate many spaces were monopolized by early arriving parkers who paid the meters all day, generally in front of their own business or place of employment. Since the enforcement of the meter-feeding ordinance these spaces are being turned over at a rate of four to five times per day and this has created many more parking spaces for the shopper.

To put teeth into the ordinance fines were increased and cars which remain illegally parked can now be towed away. The old fine of fifty cents for over-time parking only encouraged the people to violate the meter time; they were perfectly willing to pay the small fee for the privilege of remaining parked.

The new ordinance provides for a fine of $1 if paid within 24 hours, if longer than 24 hours $2 is charged. Each hour the car remains illegally parked constitutes a separate violation for which a ticket can be given. If necessary the car is impounded on issuing the second ticket.

Meters outside the core area are not regulated by the meter-feeding ordinance. These meters have five- and ten-hour time limits. Surveys have shown us that the ladies use these meters frequently, for attending beauty salons, visiting doctor's offices, and for other time-consuming activities. The five-hour meters are closer to the core than the ten-hour meters. However, these ten-hour meters are 90% occupied by 8:00 A.M. each week day and each meter generally has the maximum time purchased which indicates that workers in the downtown area are using them for all-day car storage. This phase of meter installation has, I think, relieved the downtown area of some of the 5:00 P.M. rush. The motorists walk three or four blocks to get their cars and since they are out of the congested traffic area it is simple to proceed homeward from these locations.

Privately Operated Lots

The off-street parking facilities in Huntington, except for one municipal lot which has thirty spaces, are privately operated. Our latest count of off-street space available for both public and private use amounts to 5,000 spaces. There are two multi-story parking garages in operation, one an old conventional garage, the other a new self-service garage. Nine surface-level parking lots within the business section are open to the public on an hourly rental basis. Surrounding this business section are numerous lots for rent by the week or month. Also within the business section are the lots of clubs, business places and professional people, restricted to members. Some of our biggest churches also have provided lots for their members.

Tandem parking was instituted in the city of Huntington as a further improvement in our on-street parking program. Our experience with this system has shown definite advantages. While no space was gained it does speed up parking and unparking. Drivers have been loud in their praise of this system and we intend eventually to use it for all our meter zones.

Daily Collections

Collections from our parking meters are made daily. The collector is a retired police officer. His collection has two phases: *first* he is required to collect the coins from the meters, into a collection cart. The money is removed from the meter in a can which is dumped into the collection cart. The meters are divided into collection territories and not all the meters are collected every day.

On completion of his assigned collections for the day, the collector returns to the city treasurer's office to sort, count and package the coins. This is done on a Standard-Johnson Co., Brooklyn 2, N. Y., sorter. This operation is carried out under the treasurer's supervision. The money after packaging is deposited in the bank by 1 P.M. each day.

Second phase of the collector's duty is to empty all the Duncan Fine-O-Meter boxes that are located in the business section. These boxes facilitate the payment of overtime parking tickets. Most of our fines are paid on the spot in the box or in the nearest mail box. As the traffic ticket is an envelope, carrying a first-class mailing permit, the violator does not have to pay postage. Many violators prefer to come directly to police headquarters which is in the business district to pay their tickets. They are handled by the Traffic Violation Bureau operated by civilian women. They are given National Cash Register receipts for their payment of the overtime tickets.

Court Cases

If the violation is any more than overtime the regular procedure of docketing cases for court is carried out. There are many people who attempt to evade the payment of their overtime tickets. They receive more severe treatment. Many people are habitual violators and accumulate many tickets. We notify all the people by mail of their violations and the amount due. If this fails to get results the only recourse is a warrant for arrest and impounding the car. This also calls for an increased assessment on each ticket. The court has set a five-dollar minimum on all tickets more than thirty days delinquent. In order to keep the program of collecting delinquent tickets active a full-time assignment for one and sometimes two officers is made by the Traffic Department. Many people have learned that it is extremely difficult to evade the payment of their overtime tickets.

I think that this follow-up is perhaps the most important phase of our program, because it assures the public that their rights are being protected. The person who willingly pays his ticket is not going to be the only one to pay. This I believe, gives more incentive to all violators to watch their time and if they do get a ticket to pay it promptly to avoid the extra charge and embarrassment.

Policemen are doing all of the meter checking. We have considered using women but our state laws and civil-service laws are in conflict with this idea. Soon this may be worked out so that the policemen presently checking meters can be assigned to other police duties. ◄◄

The parking-meter service man, a retired police officer, transfers coins from the meter container into the collection cart.

A coin sorter automatically counts and packages the meter earnings in the City Treasurer's office.

Caterpillar

Large sanitary fill operations utilize heavy equipment of various types. Today standard equipment is available to meet practically all conditions.

The Sanitary Fill – How It Operates

Part II–Basic principles, economics, equipment and future use of reclaimed land

The rubber-tired tractor has proven its worth in actual service. This unit is equipped with a bucket particularly adapted to sanitary fill work.

A three-part discussion on how the sanitary-fill method of refuse disposal is improving health and sanitation within American municipalities.

Certain basic principles apply to the sanitary fill regardless of the method employed. First and foremost is proper selection of the site. The site need not be large. In fact, one advantage of the sanitary fill is its flexibility. An analysis may show that it is more economical to operate at two or more small sites, rather than one single large location.

However, prior to adopting this method, a city should inventory all available sites within an economical-haul distance. No community should rely on the sanitary fill unless plenty of land is available—enough to continue the work for more than 25 years. With dumping space available

Small sites can be used to good advantage and need not be offensive to the neighbodhood.

Refuse buried in Charlottesville's (Va.) sanitary fill for six years looks like this. Some paper and rags as well as protected metal remains, but all garbage is decomposed and only a slight, musty odor is evident.

for less than 25 years, a city should give serious consideration to incineration. The city will still need disposal space for the burned residue, but this will be only 5% to 10% of the original volume of the refuse.

The summary data (beginning in Part I, February 1961, and continued with this article) shows that the area required varies over a wide range. Controlling factors include method of operation, composition of refuse, degree of compaction and amount of cover material used each day. For years the figure of seven-acre feet per 10,000 persons per year served as a guide and this figure is close to the median of the most recent data as reported in the summary.

The location of the site beyond ten to 15 miles from the collection area may make this type of refuse disposal uneconomical. However, the use of transfer stations and large trucks and trailers for hauling refuse to the disposal site has increased the economical-haul distance and this type of operation merits consideration (THE AMERICAN CITY, October 1958, p. 132 and August 1960, p. 98).

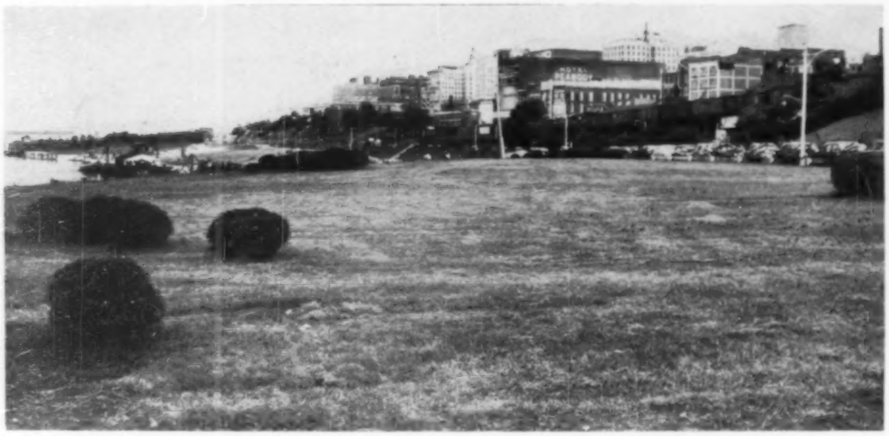
Other important considerations include evaluation of the potential hazard of pollution of drinking or irrigating water supplies, drainage, access to the site and future land use. Possible pollution of drinking or irrigation waters should be considered. Although reports indicate only a few water supplies have been polluted by sanitary fills, the possibility is a real one. Suggested precautions include:

- **Avoid filling on exposed rock strata or other areas where seepage may carry waste to water-bearing strata or wells.**
- **Locate fill at least 500 feet from drift wells unless studies indicate that sub-surface seepage is not likely.**
- **Do not locate sanitary fills on or near springs.**

In the case of future land use, controlling the operation to meet future plans can save both trouble and expense. Ames, Iowa, serves as an excellent example (THE AMERICAN CITY, June 1958, p. 92).

Control Area

Also, dumping should be controlled to keep the working area as small as possible for the size of the operation. The working face should be no larger than is necessary to accommodate the collection equipment without delay at the site. This helps



Sanitary fills reclaim land for many purposes. This river front park occupies such reclaimed land.

to control blowing of papers and other light materials and provides a better appearing fill site.

All-weather access roads and alternate dumping sites should be provided to prevent shutting down the operation during periods of inclement weather. Good housekeeping is mandatory to keep complaints to a minimum and make it easier to locate new sites. If necessary, the working area should be fenced to prevent papers from blowing around. Quick compaction and covering of the refuse is the key to a clean operation.

In many cases land use for a sanitary fill has little or no value and in practically all cases the reclaimed land has a higher value than the original purchase price.

The sanitary fill requires no permanent installations. Equipment storage buildings, sanitary facilities for operating personnel and a small building for the convenience of the personnel may all be of the temporary type—the kind that can be taken down, moved and reassembled at a new site.

The cost of operating a sanitary fill averages from ⅓ to ½ the cost of incineration. Cost figures reported by the communities listed in the survey summary vary widely and reflect the different cost-accounting methods used. A representative figure should include cost of land, equipment, depreciation, labor and overhead and miscellaneous expenses.

Equipment

The large variety of equipment on the market today permits the municipality to select machinery particularly suited to local conditions. The small community of only a few thousand persons or less may conduct a successful sanitary fill with only a farm tractor, equipped with a bucket. A large city or metropolitan county may use numerous types including dozerblade- and bucket-equipped tractors, scrapers, draglines, backhoes and even trucks to haul cover material.

While the crawler tractor with a front end bucket has served as the basic piece of equipment for many years, the rubber-tired tractor is gaining in popularity. Small communities in particular find the rubber-tired unit advantageous. Its ability to travel from place to place under its own power at relatively high speeds permits it to be used for various purposes during the day and then proceed to the sanitary fill to compact and cover the refuse collected during the day. Buchanan, Mich., reports excellent results as well as good economy can be achieved with a rubber-tired front end loader (THE AMERICAN CITY, February 1958, p. 152).

Future Use

Parking fields, parks and recreational areas constitute the more popular uses of land reclaimed via the sanitary fill. When converted to such uses, the area may be utilized as little as two years after completion of the fill. Subsequent settling of the land will usually be minor and can be corrected at little expense.

Completed fills may also be used for industrial sites and even for housing, although the latter is not recommended. If building is contemplated, it is important that caution be exercised.

Examine the area to see that gases are no longer present, or if they are present in small quantities, take the necessary precaution to vent the area to eliminate the possibility of it reaching the point where an explosion occurs.

Building foundations should be carried through the fill to native soil or, if this is impractical, special footing designs should be employed to prevent settlement. If it is known in advance that the completed fill will be used for building purposes, the operation can be conducted in such a way as to keep settlement to a minimum. This is usually done by using thin layers of refuse and heavy equipment to obtain maximum compaction.

Decomposition

The speed at which refuse decomposes in the sanitary fill varies considerably. New York and San Francisco reported relatively little decomposition in ten to 12 years, while New Orleans reports using, without insect or odor nuisance, refuse that has been buried for only three years as cover material. Charlottesville, Va., opens and reworks its sanitary fill safely and without nuisance after no more than six years (THE AMERICAN CITY, September 1959, p. 153). The rate of decomposition depends upon such factors as moisture content, volume of refuse in a given cell and relative stability of the refuse.

Coeur d'Alene, Idaho, found that the temperature in the fill serves as a good indication as to whether the fill is "working." Refuse covered for three months will attain a temperature approximately 20°F higher than that of the surrounding ground. When the temperature drops close to that of the surrounding ground it indicates that bacterial action has dropped enough so that it no longer constitutes a problem.

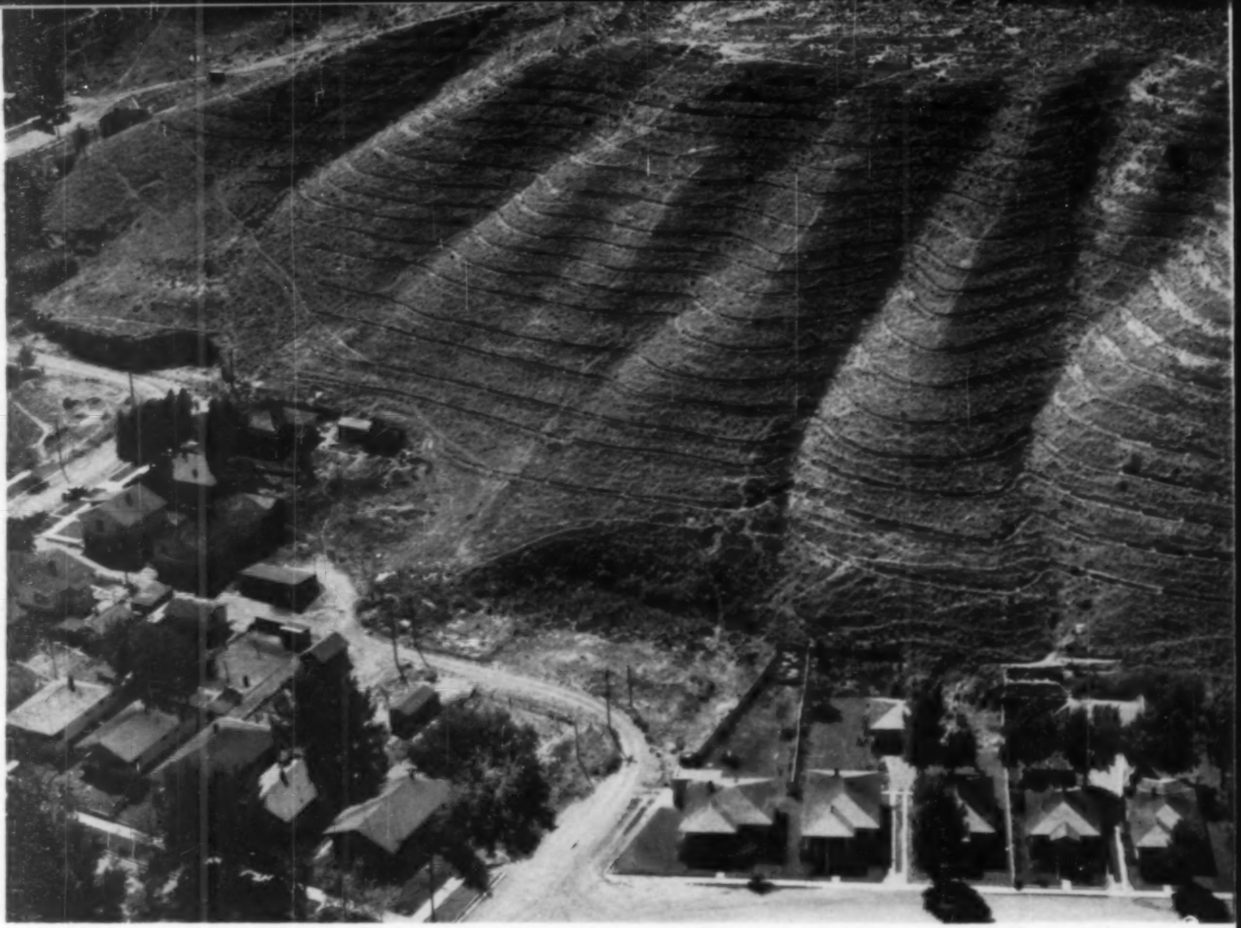
Part III will describe the three methods of operation and cite several examples of each. ◄◄

City	People Served	Annual Volume t=tons cy=cubic yards	Type	Depth		Cover Material	Years in Operation	Settlement	Crew Size	Annual Acre Feet	Annual Operating Cost	Evidence of Decomposition	Equipment Used
				Refuse	Cover								
MICHIGAN													
Ann Arbor.....	75,000	20,800 cy	ramp	6′	18″	sandy clay	9 months	....	1	7	$30,000	none	1 977 Caterpillar Traxcavator
East Lansing.....	33,000	50,000 cy	area and ramp	3′	1′-2′	sand	6	approx 10″ a year	1	....	$.30 per cy	none	1 D4 Caterpillar Tractor with 1¼-yard Bucket
Hillsdale........	7,600	5,000 t	trench	5′	1′	sandy loam	1	none	2	....	....	none	1 Caterpillar Tractor with a 1-yard Bucket
Howell..........	5,500	....	area	3′-4′	1′	sand	2	unknown	1	3-4 approx.	$3,600	none	1 Allis-Chalmers 1-yard Crawler Front End Loader
Lake Linden.....	1,500	1,000 t	trench	6′	2′	sand	2	3″	....	....	$1 per ton	none	1 TL 12 Tractomotive Corp. Loader Bucket
Midland........	28,000	44,000 cy	ramp	4′-6′	2′	clay and sand	2	....	1	....	$10,120	none	1 TD 14 International Bulldozer
Mount Clemens..	22,000	....	area	18′	18″-2′	sand and loam	6	10″	1	3	$125,000	none	International TD 14 Bullclam
MINNESOTA													
Rochester.......	40,000	150,000 cy	ramp	13′	2′	sand and sandy loam	10	....	2	39	$27,320	none	1 Allis-Chalmers HD 11G 3-yard Tractor Shovel, 1 Lorain ½-yard Dragline on Crawler Tracks
MISSSISIPPI													
Greenville......	45,000	20,075 t	area	....	1′	sand	8	....	3	4	$.83 per ton	none	1 International Bulldozer, 1 Drag-line part time (½-yard)
Jackson.........	146,000	72,000 t	trench and area	6′-20′	2′	clay and loam	1	....	2	3	$.52 per ton	none	Front End Loader 2¼-yard. ° Allis-Chalmers D-11 G, I International 14
MISSOURI													
Jefferson City....	20,000	15,000 t	trench and ramp	6′	2½′	clay	2	....	2	54	....	none	D 7 Caterpillar Bulldozer, 1 D 7 Caterpillar with an 11-yard Scraper
NEW HAMPSHIRE													
Concord........	30,000	36,000 cy	ramp	8′	1′	sand	3	negligible	1	26	$.75 per cy	none	1 955 Caterpilar Traxcavator
NEW MEXICO													
Albuquerque....	50,000	92.000 t	trench	20′	4′	sand and clay	11	....	6	150	$.50 per ton	none	1 D 8 Caterpillar, 1 D 9, 1 18-yard Scraper, and 1 112 Motor-Grader
Hobbs..........	27,000	...	trench	14′	3′	sand	15	5′ in 10 yrs	2	10	....	....	¾-yard Shovel, 1 1½-yard Loader
Santa Fe........	35,000	8,840 cy	combination	4′	2′	sandy clay	4	....	2	....	$15,000	none	1 AC 11 Allis-Chalmers Tractor
NEW YORK													
Canandaigua..	10,000	3,600 t	area	4′	1′	clay, loam		....	1	....	....	very slight	1 TD 9 International Drott Bulldozer
Croton-on-Hudson	7,000	500 cy	area	3′-5′	1′-2′	sand and loam	3	....	....	½-1	....	none	
NORTH CAROLINA													
Asheville.......	70,000	237,632 cy	....	20′	2′	loam	15	12″	3	10	$7,350	very little	1 Caterpillar 977 Traxcavator, 1 Allis-Chalmers Crawler HG-9
Elkin............	3,200	10,000 cy	trench	5′	2½′	loam	7	6″	1	....	$5-6,000 approx.	none	1 Allis-Chalmers Crawler Tractor, 6-foot Bucket

City	People Served	Annual Volume t=tons cy=cubic yards	Type	Depth		Cover Material	Years in Operation	Settlement	Crew Size	Annual Acre Feet	Annual Operating Cost	Evidence of Decomposition	Equipment Used
				Refuse	Cover								
Greensboro	125,000	164,000 t	trench and area	variable	1′	clay	10	....	6	....	$.22 per ton	some	1 ¾-yard Northwest Dragline, 2 HD 11 Allis-Chalmers Bulldozers, 1 10-yard Pan Caterpillar D 7 Tractor
High Point	62,000	....	area	6″	3″	decomposed granite	4	....	2	6	$12,200	none	1 D 6 Caterpillar and 10-yard Pan; 1 D 6 Caterpillar Bulldozer
Mount Airy	8,000	....	area	8′	18″	clay	12	varies	1	5.6	$6,000	none	1 TK 14 International Tractor equipped with Drott Bullclam, a 2-yard Bucket
Southern Pines	8,000	20,000 cy	trench	3′	1½′	clay	10	....	2	5	$5,000	none	1 HD 6 Allis-Chalmers Tractor
Winston-Salem	150,000	60,000 t	area and trench	30′	3′	clay and some stone	12	none	2	....	....	none	2 Allis-Chalmers 11 G Tractors, 1 Caterpillar with a 2¼-yard Bucket
NORTH DAKOTA													
Jamestown	15,000	4,000 cy	trench	6′	18″	clay	5	12″	1	1.25	$2,500	none	1 Caterpillar 977 Traxcavator
Minot	22,000	95,000 cy	area	4′-5′	12″-18″	clay	2	....	2	....	....	none	1 TD 24 International with Dozer and 1 TD 14 International with Bullclam
Bismark	28,000	100,000 cy	ramp	10′-12′	18″	sandy clay	9	small amt.	3	15	$12,000	none	International TD 20 with Drott Bullclam
OHIO													
Avon Lake	9,500	5,000 t	trench	2′	1′	clay	10	18″ in 5 yrs	1	¾	$4,000	none	1 D 6 Caterpillar Bulldozer
Chillicothe	30,000	13,000 cy	trench	10′	....	clay and sand	5	....	....	....	$10,000	none	1 Allis-Chalmers Tractor, 2½ yard Bucket
Fairborn	20,000	30,000 cy	area	1¼′	1′	clay	6	....	3	....	$19,000	yes	2 Crawler Front End Loaders
Hamilton	75,000	250,000 cy	trench	30′	2′	loam and gravel	12	30″ max. in 10 yrs.	4	2¼-2½ approx.	$30,850	none	1 HD 21 Allis-Chalmers Bulldozer with Hydraulic Blade; 1 1¼-yard Lorain Dragline
Lorain	65,000	18,000 t	trench	14′	4′	clay	12	....	4	....	$.98 per ton	none	1 Lorain Thew TL 20 Shovel with a ½-yard Dragline, 2 Oliver Bulldozers, 1 Oliver Hi Lift, with a ¾-yard Basket
Middletown	25,500	14,000 t	trench	10′-12′	2′	sand and gravel	5	....	2	30	....	slight	2 International Drott Bullclams, 1 15-150 Series and 1 14A Series, both with Buckets
Tiffin	21,000	6,800 cy	ramp	9′	2′	loam	7	4″-5″ in 5 years	2	27	....	....	1 TD 14A International Bulldozer, 2-yard International Drott Bullclam
Urbana	10,500	24,000 cy	trench	2′	1½′	sand, gravel and loam	6	1′	1	....	....	....	1 International Bulldozer
Washington Court House	13,000	....	trench	4′	1′	sand, clay and loam	10	....	1	3 to 5	$11,500	none	1 Allis-Chalmers HD 4
Xenia	20,000	48,934 cy	trench	30′	6″	clay and gravel	9	none	2	1-5	....	none	1 Caterpillar 977 Traxcavator with a 2-yard Bucket
Celina	7,760	9,000 cy	area	3′	2′	clay	10	....	2	6	$32,000	none	1 Caterpillar Crawler Tractor with Dozer Blade
Delaware	15,250	31,500 cy	trench	4′-5′	2′	clay	9	....	1	1	$7,135	none	1 1¼-yard Allis-Chalmers Bucket Loader

City	People Served	Annual Volume t=tons cy=cubic yards	Type	Depth		Cover Material	Years in Operation	Settlement	Crew Size	Annual Acre Feet	Annual Operating Cost	Evidence of Decomposition	Equipment Used
				Refuse	Cover								
OKLAHOMA													
Bartlesville	30,000	162,845 cy	....	6′	2′	loam	8	....	1	....	....	none	1 Allis-Chalmers Dozer
Durant	10,000	31,680 cy	trench and area	6′	2′	loam	7	4″-5″ in 5 years	1	....	$5,000 approx.	none	1 HD 5 Allis-Chalmers, 1¼-yard Bucket
Enid	45,000	233,834 cy	ramp	5′	2′	clay	6	10%	1	72	$.039 per cy	none	1 TD 18 International Tractor, 1 TD A International Tractor, 1 10-yard Carryall
Seminole	12,500	31,200 cy	....	2′	2′	sandy loam	6	none	1	10	$4,000	none	D6 Caterpillar Tractor
Claremore	8,000	26,000 cy	trench	1½′	4″	clay	10	4″ in 4 years	2	....	$6,000	none	1 TD 9 International Front End Loader
Tulsa	200,000	60,000 t	trench	3′-4′	6″	clay	15	....	3	....	$35,000 approx. per year	none	1 D 7 Caterpillar Tractor with Angle Dozer, 1¾-yard Northwest Dragline, 2 International TD 18 Tractors with Angle Dozers
OREGON													
Milton-Freewater	4,500	1,300 t	trench	2′	½′	loam	1	....	1	....	$8,000	none	1 D 7 Caterpillar with Straight Blade
Pendleton	15,000	....	area	6″-18″	3″-6″	loam	1	....	2	....	....	only when opened	1 D 7 Caterpillar Bulldozer
PENNSYLVANIA													
Bethlehem	75,000	33,276 t	ramp and trench	6′	1′	sandy clay	18	24″ in 1 year	7	....	$36,500	none	1 Case 1000 Crawler Tractor, Front End Loader, 1 Allis-Chalmers Front End Loader, 1 Caterpillar Crawler Tractor with Dozer Blade, 1 Allis-Chalmers Crawler Tractor with Angle Dozer Blade
Hanover	16,500	7,378 t	trench	2′	8″	loam and shale	3	3″ in 3 years	1	18	$2,53 per ton	none	1 TD 9 International Tractor, 1½-yard Drott Bucket
Scranton	110,000	22,000 t	trench	....	....	....	5	....	4	....	$12,480 labor only	none	2 Allis-Chalmers Bulldozers
Donora	11,500	12,000 t	ramp	6′-12′	2′-3′	clay-loam	8	2′ in 8 years	1	....	....	....	1 HD 6 Allis-Chalmers Tractor 1½-yard Bucket
SOUTH CAROLINA													
Greenville	68,000	231,000 cy	trench and ramp	3′	4″-6″	clay	3	....	3	....	....	none	2 D 7 Caterpillars with Blades 1 Caterpillar 70 Scraper
SOUTH DAKOTA													
Pierre	10,000	7,100 cy	trench	5′	2′-3′	sandy silt	½	....	1	....	$7,200	none to date	1 D 7 Caterpillar Bulldozer
Rapid City	48,000	14,000 t	trench	8′	2′-2½′	gumbo and shale	8	negligible	4	32	$39,737	none	1 International Crawler Tractor and 1½-yard Shovel
Aberdeen	23,000	37,400 cy	....	10′	3′	clay	8	5′ 1st yr 6″ 2nd yr less than 1″ 3rd yr	1	25	$5,000	smoke and odors (burn combustibles)	Allis-Chalmers HD9 with Bull-clam 2½-yard Bucket Size
TENNESSEE													
Columbia	21,000	32,760 cy	trench	1½′	10″	loam	2	....	2	....	$26,000	none	1 Caterpillar 955 Traxcavator, 1 Allis-Chalmers 16 Dozer, 1 Pan

(This table will be concluded in the April issue.)



Contour-furrowed hills west of Pocatello have protected the city from damaging floods for the last 20 years.

20-Year Watershed Program

Extensive contours built during depression years in one of the country's first watershed programs has protected Pocatello, Idaho, from the damage of run-off from its hillsides

By **OSCAR L. ONSTOTT**
Soil Conservation Service
U. S. Dept. of Agriculture

"Look to the hills! See the marks of distinction!" old-timers of Pocatello, Idaho, proudly boast as they point out enough contour furrows on sloping foothills surrounding their city to stretch from the Utah-Idaho border to Canada.

Unique? Yes—Pocatello boasts of one of the earliest watershed programs in the country. Time, sweat, planning and cooperation have made it so.

Why are the furrows there? To solve a problem, a problem caused by man's short-sightedness and abuse of nature, to solve the effects of overgrazing by thousands of sheep trailing to summer ranges that held back the water from rain and sudden storms.

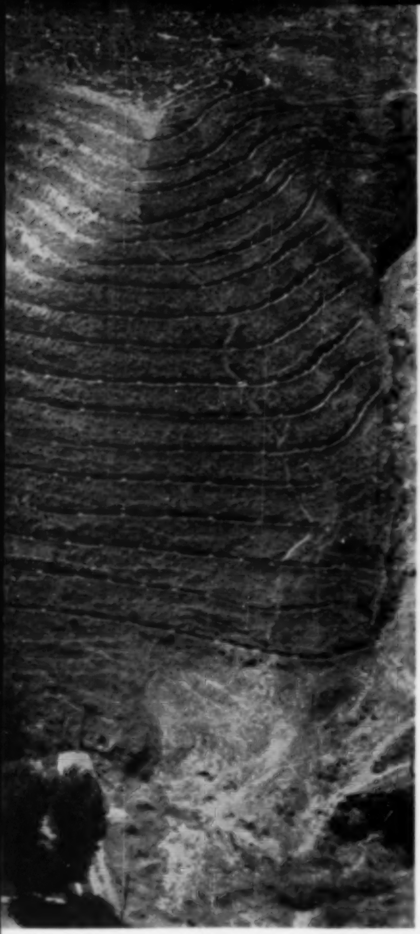
As the vegetation was destroyed, erosion took over. Storms which once produced only normal run-off now became flash floods, leaving boulders and debris clogging city streets and flooding basements of homes; floods so severe that their scars still show after 20 years of corrective treatment.

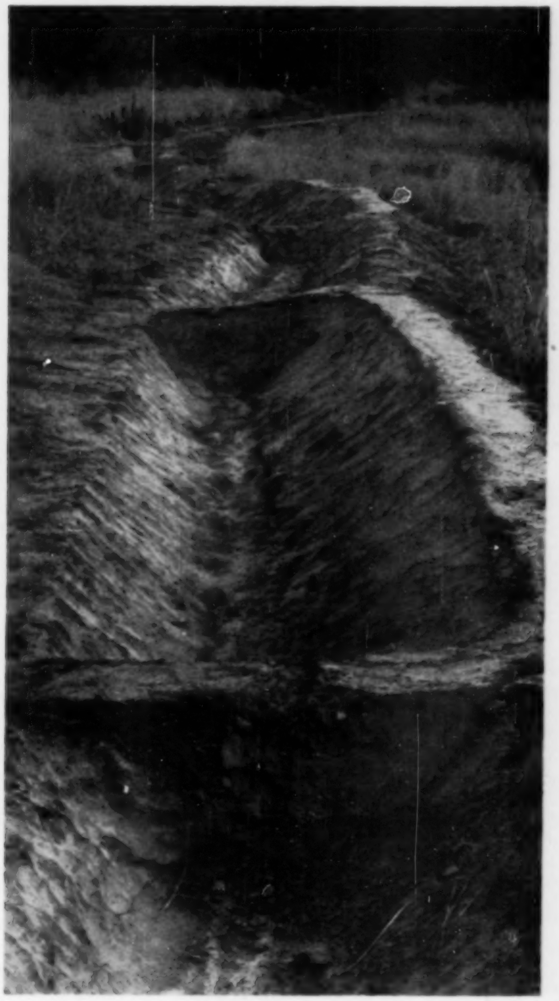
It's an old story, but one so important that students of foreign lands come to observe and study these furrows and their benefits for adaptation to their native lands.

In the 1930's, Pocatello residents and city officials became concerned about floods and threats of floods and appealed to the federal government for help. As a result a Civilian Conservation Corps camp was set up to launch a flood-control project.

The project comprised some 10,000 acres of foothills and benchlands on the east and west sides of the city. The major portion of this area was grazed by cattle and sheep. One of the first steps was to exclude livestock grazing.

By April 1936, about 50 miles of contour furrows had been completed.





Check dams such as these help hold water on the slopes and prevent flood damage below.

So successful was this mechanical control measure that no run-off occurred in the drainages where this work was done. Encouraged by this accomplishment, man, beast and machine pushed ahead for control of the entire city watershed.

On the gentle sloping lands, plows especially designed and built by SCS engineers and pulled by crawler-type tractors, followed guide lines carefully staked to make sure that the complete furrow was on the contour. A special damming attachment at the rear of the plow and operated by a power lift left regularly spaced check dams to catch and hold water within compartments in the furrow.

On steeper lands horse-drawn plows opened up the furrow and CCC boys used shovels to shape the furrows to completion. On very steep slopes furrows were built by hand labor without the help of plows.

By June 30th, 1939, more than 849 miles of furrows affecting 2,625 acres of watershed had been constructed.

Floods were eliminated by these miles of furrows spaced at 20- to 50-foot intervals depending upon the steepness of the land. Each furrow formed a reservoir, being constructed to a depth of 14 inches with a 12-inch bottom width and a 48-inch top width. During heavy rains, water trapped in these man-made basins gradually seeped into the soil or evaporated.

Revegetation was also part of the plan. Newly constructed furrows were seeded to mixtures of sweet clover, crested wheatgrass, mountain brome, alfalfa, and native bunchgrass. Above-average rainfall helped establish a grass cover.

After more than 20 years these furrows still protect the city although they have been damaged by jeep trails, hot-rod enthusiasts, natural erosion and trespassing stock. City expansion has erased some of them, and some have filled in. Yet it was not intended that they last forever, for, as anticipated, vegetative cover took over the job of protecting the watershed as the furrows began to lose their effectiveness.

Repairs have been few, confined chiefly to the work of Boy Scout troops and other groups interested in conservation.

What does the city think of its watershed? Enough that its officials have turned down attempts to graze the watershed lands, and enough to cooperate with federal and state agencies in hiring a fire guard to protect their watershed from fire damage during dry periods.

"Over a period of years," said W. B. Webb, Pocatello city manager, "these furrows have saved the city several thousand dollars in labor and other storm drainage costs." ◀◀

The gas-control room has its own completely separate entrance.

More Digestion Capacity But No New Digesters

Iowa City uses high-rate digestion with existing tanks for economical expansion of the sludge-digestion system

By **H. S. SMITH***

Seventy-five percent more capacity in the same digestion tanks after 24 years service, at a cost of only 88 cents per capita for the added capacity—this is the result of the catalytic reduction process of high-rate sludge digestion applied to the Iowa City, Iowa, sewage-treatment plant. The plant provides trickling filter-separate sludge digestion treatment for the city and the State University of Iowa. The new construction is a plant scale application of the process for which research and development were conducted at the State University of Iowa sanitary engineering laboratories on the treatment plant grounds, under the direction of Professor Philip F. Morgan. While mayor of Iowa City, Professor Morgan conceived the idea for this improvement in conjunction with Plant Superintendent M. F. Neuzil.

The original plant, placed in operation in 1936, included a two-stage digestion system consisting of a 33,000-cubic-foot primary digester with movable cover and mechanical mixers and a 69,000-cubic-foot secondary digester with a gas holder cover. At a conventional loading of three cubic feet per capita, the system provided digestion capacity for 34,000 population.

Both tanks contained internal heating coils. A sludge-gas-fired hot-water heater and hot-water circulating pumps in the nearby screen and pump building produced heat which was used for the digesters and plant buildings.

Drying Beds

Drying beds were constructed for sludge dehydration. However, the site provided ample room for simply constructed lagoons in which digested sludge could be easily dehydrated without nuisance. The sludge-drying beds have been held in reserve in favor of lagoons due to the lower operating cost and general simplicity of lagoon dewatering. With adequate lagoon capacity available, prior sludge concentration, either in the digestion system or in special facilities, becomes unnecessary and the full digester capacity can be used for active digestion.

The population served at the beginning was 24,000. In 1958, loading on the digestion system was from 6,000 to 6,500 pounds of solids per day, a population equivalent of 33,000 to 36,000. This approximated the capacity for which the system was designed but low capacity and deterioration of the heating system prevented maintenance of satisfactory digester temperature and complete breakdown of digestion occurred each winter. In fact, the operators resorted to wood-burning stoves for building heating prior to the improved system.

Improvement Program

Replacement of the heating system would have permitted operation of the existing system at design capacity but continuing population growth would have quickly resulted in overloading. An increase in capacity was essential for any new design.

We recommended the catalytic reduction process of high-rate digestion to increase system capacity since it could be readily applied to the existing facilities and since the cost of the added capacity thus achieved would be much less than conventional expansion. This process recirculates gas through a diffuser in the bottom of the digestion tank, bringing the gas into intimate contact with the solids and maintaining a homogeneous mixture of fresh and digesting solids throughout the tank. This accelerates the digestion process so, that loadings three or more times those applied in conventional systems can be handled. We expected favorable results on the basis of the local research as well as some other full-scale applications.

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* Mr. Smith had charge of the project design for Stanley Engineering Co., Muscatine, Iowa.

Primary Digester

We applied this process to the primary digester, increasing the nominal capacity of this tank to 6,600 pounds of solids per day or 37,000 population equivalent at a loading of 0.2 pounds of solids per cubic foot per day. The existing secondary digester is used as a transfer and digested-sludge storage tank and gas holder but can be operated in parallel with the high-rate primary digester as a conventional single-stage digestion tank to provide capacity for another 23,000 population equivalent. Thus, the system with the catalytic reduction process applied to the primary tank provides 60,000 population nominal capacity, which is 26,000 population or 75% more than the original design capacity of the same tanks.

If we ever find that it is necessary, we can apply the catalytic reduction process to the secondary tank, increasing digestion capacity to over 110,000 population equivalent.

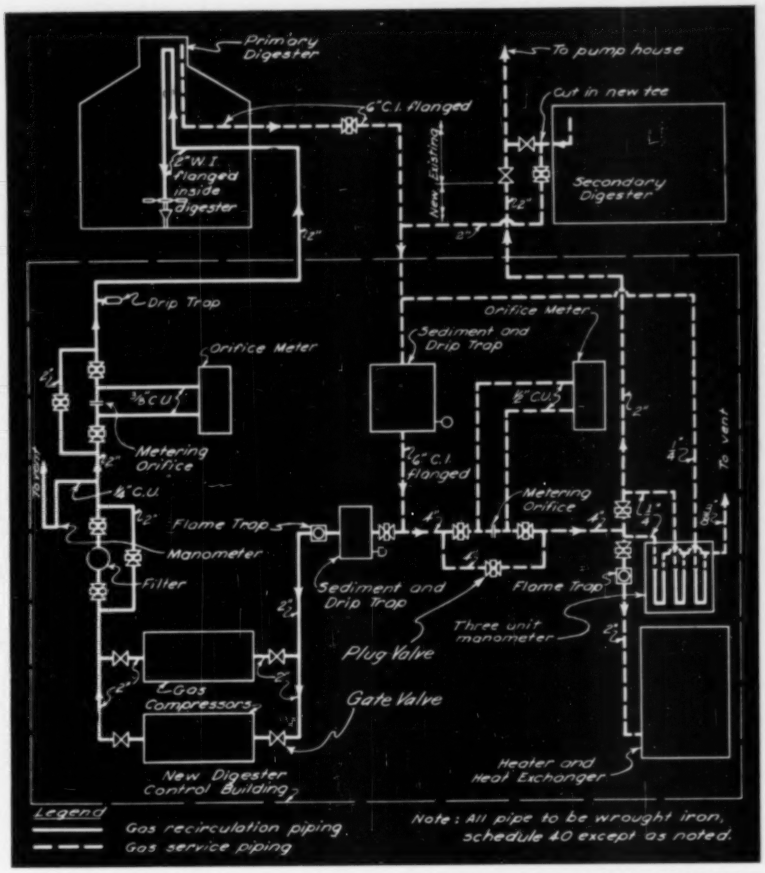
Construction included the following:

1. Fixing and modifying the existing primary digester moving cover and installing dual gas pumps, gas metering equipment and gas diffuser, all of which were furnished by the Chicago Pump Company.

2. Installation of a 750,000-BTU-per-hour, gas-oil-fired sludge heater and a sludge circulating system arranged to circulate the contents of either tank through the heater, furnished by the Pacific Flush Tank Company.

3. Construction of a new building for housing the gas recirculation, sludge heating and sludge circulating equipment. This was done by contract with the Red Ball Engineering and Construction Company and included equipment installation, piping and electrical work.

4. Digester cleaning and preparatory work, all done by the plant personnel.


Primary Digester
To pump house
Cut in new tee
6" C.I. flanged
New Existing
Secondary Digester
2" W.I. flanged inside digester
2"
2"
2"
Drip Trap
Orifice Meter
Sediment and Drip Trap
Orifice Meter
3/8" C.U.
1/2" C.U.
2"
Metering Orifice
2"
1"
6" C.I. flanged
To vent
To vent
1/4" C.U.
Metering Orifice
2"
Flame Trap
4"
4"
1/4"
Manometer
Filter
Sediment and Drip Trap
Flame Trap
Three unit manometer
2"
2"
Plug Valve
2"
2"
Gas Compressors
Gate Valve
New Digester Control Building
Heater and Heat Exchanger
Legend
Gas recirculation piping
Gas service piping
Note: All pipe to be wrought iron, schedule 40 except as noted.

This schematic drawing indicates the gas-service and recirculation piping.

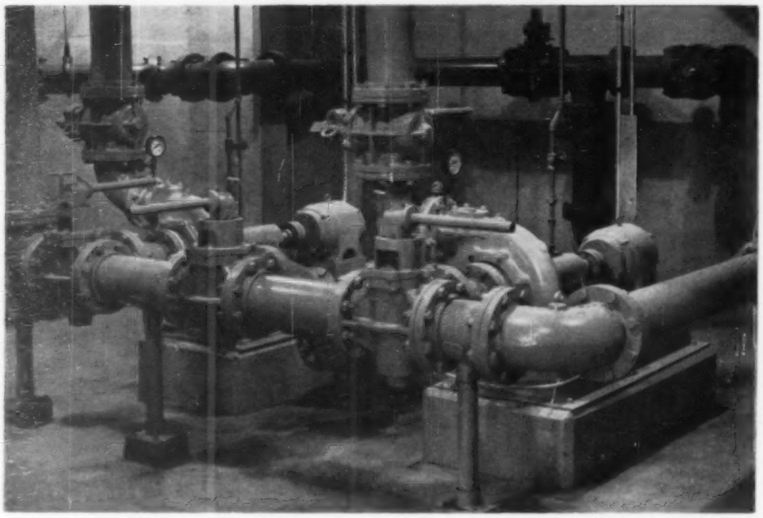
The building arrangement affords complete separation of gas pumping, metering and control equipment from the sludge heater and circulating pump room, in that way removing the explosion hazard which existed in the original sludge-gas utilization system.

Operating Results

A detailed study of the improved digestion system operation during August and September 1959, after about 14-months use, provided the subject for a master of science thesis by William Ide. Mr. Ide's studies showed primary digester loadings, with the catalytic reduction process, of 0.142 pounds of total solids per cubic foot per day of which 0.089 pounds were volatile solids. At this loading gas production was 8.97 cubic feet per pound of volatile solids; volatile solids reduction averaged 60.6% and volatile acids remained constant at 220 ppm; all values together with physical characteristics of the digested sludge showing satisfactory operation.

The study period occurred between the end of the University summer session and opening of the fall term when the connected population was 10,000 below normal and solids loading was correspondingly low. Plant operating records show present total solids loadings of 0.24 to 0.25 pounds per cubic foot per day with essentially the same volatile solids reduction and volatile acids level as observed in Mr. Ide's study. Thus, the system is actually handling loadings 25% in excess of nominal high-rate design loading of 0.20 pounds.

Two details of the installation created minor operating difficulties which we subsequently rectified. The gas diffuser was initially installed 30 inches above the digester floor. Sampling of the tank contents revealed a high solids concentration zone near the bottom of the tank below the diffuser. After it was lowered to a point eight inches above the tank floor; the heavy solids zone



Sludge-circulating pumps and control valves were installed with one eye on maintenance convenience.

was dispelled and solids concentration became substantially constant throughout the tank, ranging from 4% to 6% from top to bottom.

Soon after the system was placed in operation, it was found that most of the gas was being produced in the secondary digester, into which digested sludge is transferred in amounts equal to raw-sludge pumpage to the CRP-equipped primary digester. This showed incomplete digestion in the primary digester. The difficulty was traced to short circuiting from the raw-sludge inlet to the transfer outlet, which were located in proximity to each other. We readily corrected this condition by changing the transfer outlet point. Now, substantially no gas is produced in the secondary tank, showing that complete digestion takes place in the primary tank.

Cost

The total cost of the improvement, including all equipment and construction contracts, and work by plant personnel and engineering, was $85,292.15. Of the total, $23,000 was spent for the equipment, materials, installation and housing for the catalytic reduction process. The balance of the cost was attributable to the new heating system which was necessary regardless of the method used to achieve increased digestion capacity.

The catalytic reduction process has permitted Iowa City to increase its nominal digestion capacity from 34,000 to 60,000 equivalent population at a cost of only 88 cents per capita. If the same additional capacity had been provided in conventional digestion tanks, 78,000 net cubic feet additional tank volume would have been required at a cost of about $125,000 or $4.80 per capita plus the added cost of a larger heating system required for the much greater tank volume.

The catalytic reduction process of high-râte sludge digestion, applied to the original digestion tanks at Iowa City, has increased digestion capacity by 75% at a cost less than ⅕ that required to provide the same capacity in a conventional system. Results as measured by gas yield, volatile solids reduction and volatile acids level, remain as good or better than those achieved in conventional digestion systems. Continuous successful operation at loadings 25% in excess of nominal design shows even greater solids handling capacity than anticipated. The system has presented no abnormal operating problems, and, in fact, is expected to reduce operating problems due to better control of digestion conditions. ◄◄

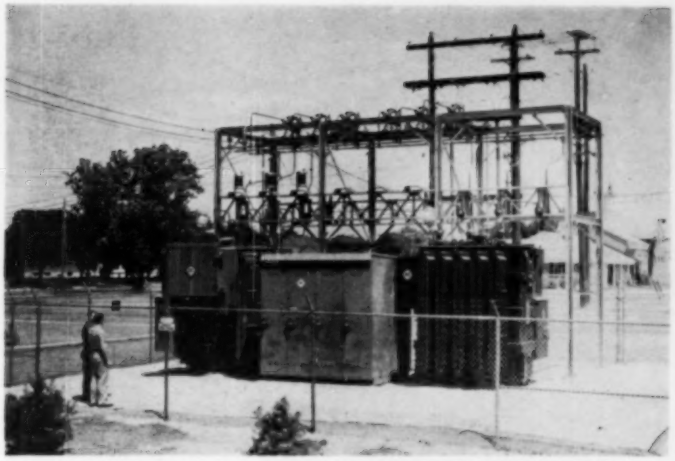
Water Supply to Rise in California, Florida

A spot check of water supply in representative cities in California and Florida, two of the nation's fastest-growing states, shows that water supply facilities will take a fast turn upward to keep pace with the booming urban growth there. The California sampling from 102 cities scattered throughout the state showed that 55% by their own appraisal had water systems that are inadequate; the Florida sampling showed 39% inadequate.

The same study showed that 39% of the California cities had plans on the drafting boards to correct these deficiencies and another 14% had projects in progress. This was somewhat more vigorous action than that taken by the cities in Florida, where 33% were drawing plans but only 2½% were acting to correct the deficiencies.

The tabulation of the survey appears in the table to the right. ◄◄

	California		Florida	
	Number	%	Number	%
Total Respondents	102	100.0	39	100.0
Water Supply				
Adequate	46	45.1	24	61.5
Inadequate*	56	54.9	15	38.5
No plans to correct	2	2.0	1	2.6
Planning to correct	40	39.2	13	33.3
Acting to correct	14	13.7	1	2.6
Changes:				
Anticipate system changes*	90	88.2	32	82.0
Rationing	3	2.9	1	2.6
New or additional facilities*	74	72.5	17	43.6
Improvements in water quality	9	8.8	8	20.5
None—need none	11	10.8	7	17.9
None—but should have improvements*	2	2.0	2	5.1
*** Total inadequate, needing system changes or additional facilities**	94	92.2	34	87.2



Two step-down substations serve the 4,160/2,400-volt distribution system which provides part of the community with power; the new station generates at 12,470/7,200 volts.

BOOMER
LAKE
STATION

→

A bright spot in the city's municipal budget is its power-generating system and its new station in particular.

Boomer Lake Power Dividends

By **C. H. GUERNSEY, Jr.***

Stillwater's municipal power system provides 68% of the city's total revenue. This results in an *ad valorem* levy of nine mills, the only city tax now being paid by residents of this Oklahoma community, and it is used for the retirement of bonded indebtedness.

The new Boomer Lake station had its start in 1954, when the city, after operating its initial plant for 53 years, engaged our firm to make a long-range comprehensive power study. Two years later the station went on the line for commercial operation with a nameplate rating of 10,000 kw, but with an actual capability of 11,500 kw.

The cost of construction of the new generating station, financed by a $1,700,000 bond issue, amounted to approximately $142 per kw, nameplate rating. The building includes additional facilities such as circulating water intake and a water-discharge system designed for a plant of up to 60,000 kw. Also included were a Shaw-Box 25-ton, cab-operated overhead crane; 2,000-barrel fuel-oil tank and other common facilities.

As predicted in our power requirement study, growing power demand indicated the need for additional capacity by 1960. In 1958, Stillwater approved by a 10-to-1 margin a general obligation bond issue of $2,150,000 to enlarge the station. Actual construction on the expansion started in February 1959, and, despite a four-month delay on delivery of the turbine generator the unit was placed on the line one year later.

With the addition of a 12,650-kw (AIEE-ASME preferred standard rating) Allis-Chalmers turbine-generator at the Boomer Lake Station, Stillwater now has a generating nameplate capacity of 30,560 kw, including the now-standby Fourth Street Station, a steam plant rated at 8,000 kw.

Basic Units

Basic units of the new addition include an Erie City Iron Works steam generator rated at 150,000 pounds, 635 psig, 825° F; Bailey Meter combustion control system and boiler and turbine control panels; Allis-Chalmers surface condenser, boiler feed pump, de-aerator, switchgear and distribution substations; and Nelson Electric motor control center, station power transformer and switchgear.

Careful engineering of the original installation helped to keep the cost of the new unit to approximately $133 per kw, nameplate rating;

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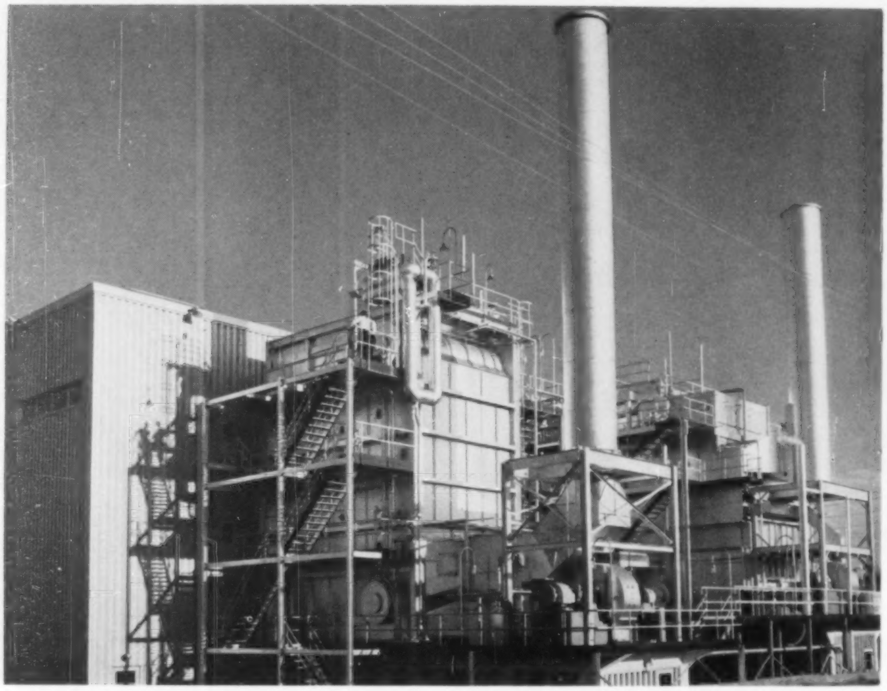
* Mr. Guernsey is Vice President of C. H. Guernsey & Company, Consulting Engineers of Oklahoma City, Okla.



This view of the outdoor section of the Boomer Lake section shows the No. 1 (left) and No. 2 steam generators, rated at 125,000 and 150,000 pounds per hour, respectively, at 625 psig, 825° F.

planned for overall economy and expansion, the building is a semi-outdoor, steel-frame type construction. It is supported on belled concrete piers with the exterior wall extending 50 feet above the ground floor. Construction is of insulated double steel panels with stainless steel exterior. Panels on one side are bolted on to allow for removal and further extension of the building.

Gas-fired steam generators on both units are of the outdoor type with only the operating faces of the windboxes within the building. Both have combination gas and standby oil burners.

Boiler and turbine operating levels are at the same elevation, accomplished by use of boiler foundations of concrete piers supported on belled footings tied at ground level and at boiler base level with concrete beams. Space beneath both steam generators is walled in with double steel panels and serves as shop and material storage areas.

Economical Operation

Economical operation helps make Stillwater's power system highly profitable. With an annual total system load factor last fiscal year of 40.4%, the new plant obtained a thermal efficiency of 24.6% or 13,850 BTU per net kw-hr. Although the cost of natural gas increased over 25% during the past year to about 20.8 cents per million BTU—present annual fuel cost now averages only about 2.6 mills per net kw-hr. The accompanying table lists other operating data.

Plant Details

The steam plant is of pressurized furnace design for natural-gas firing with fuel-oil standby. The combustion control system of the second unit is cross-connected with the No. 1 unit. Either system may act as a master control for both units when they are operating in parallel.

Final steam temperature of Unit No. 2 is controlled at 825°F through a range of 65,000 to 150,000 pounds per hour steam flow by a Copes-Vulcan controlled-spray attemperator. Included in the unit is a regenerative-type air pre-heater which reclaims heat from boiler-flue gas and reduces combustion fuel requirements.

The forced-draft fan is driven by either an 1,800- or 1,200-rpm motor. Connecting these motors directly to the fan shaft through free-wheeling clutches permits selective use of the motor more nearly matching partial-load fan requirements, thereby reducing station power usage. The clutches allow either motor to be disengaged from the shaft without stopping the fan.

The turbine of the second unit is rated at 12,600 kw (AIEE-ASME

OPERATING DATA
Boomer Lake Station, Stillwater, Okla.
Fiscal year ending June 30, 1960

Gross plant generation	**38,651,000 kw-hr**
Station power requirements	**6.59% of gross**
Distribution and transformation losses	**11.29% of gross**
Total production cost	**4.41 mills per kw-hr**
Total power cost*	**14.16 mills per kw-hr**
Net profit	**$485,690**
Maximum annual peak load to date	**11,300 kw**
Minimum recorded load	**2,200 kw**
Average ratio daily peak load to minimum load	**About 3 to 1**

*** Includes cost of production, distribution, accounting and collecting, and general administration, including interest and 3% depreciation.**

preferred standard rating). Nameplate rating on the generator is 15,000, .85 power factor. Capability of this unit is in excess of 14,000, due to compatible sizing of all auxiliary equipment.

Circulating Water

Turbine type pumps supply circulating water to the surface condenser from Boomer Lake, and this water returns to the lake about a quarter of a mile from the intake. Temperature of the lake water rarely exceeds 80°, despite ambient air temperature often exceeding 100°. Thus the maximum absolute back pressure of the condenser is less than 1.5 inches Hg, ranging down to less than .5 inches Hg during winter.

A two-step Permutit demineralizer provides boiler make-up water. Effluent discharges to a 12,000-gallon cold-storage tank located outside. One end of the tank, however, is enclosed in the building.

The generator is cable-connected to outdoor metalclad switchgear and controlled by duplex panels on the operating floor. A supervisory control panel provides for remote operation of distribution feeder circuit breakers in the old Fourth Street Station.

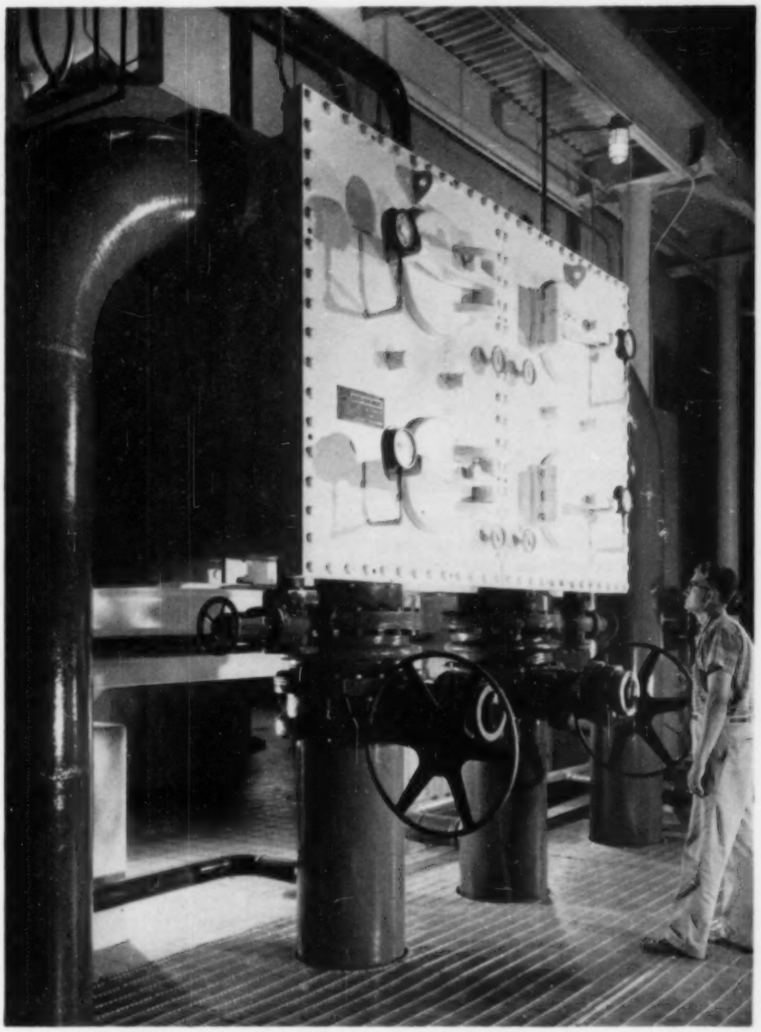
Distribution

Boomer Lake Station generates at 12,470/7,200 volts and presently connects into Stillwater's 4,160/2,400-volt distribution lines via two step-down substations. As the system grows, it is being converted to 12,470/7,200-volt operation with direct supply from the generator bus. Use of higher distribution voltage will ultimately eliminate transformation losses and provide the most economical method possible for serving the city.

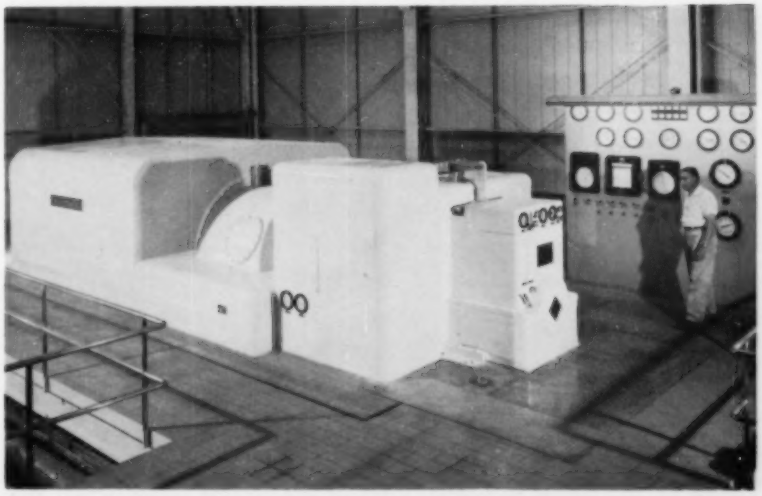
The city itself is a good customer. In the fiscal year ending June 30, 1960, gross plant generation amounted to 38,651,000 kwh. Approximately 1,279,000 kwh was distributed to the city for buildings, street lights, sewage department, recreational-area flood lights, traffic lights and similar facilities, plus free electricity for a local mission. Station power requirements were 2,500,000 kwh and another 4,000,000 kwh went into distribution and transformation losses.

Long range planning by the City Commissioners of Stillwater has provided the city with a municipal power system that lifts a big load from the shoulders of the taxpayers.

Credit for this long-range planning belongs to Mayor A. B. Alcott, the City Commissioners and Manager of Utilities E. E. McDaniel. ◄◄



Directly beneath the No. 2 turbine generator is the surface condenser (with an area of 13,000 square feet) that serves the unit.



The first addition to the new station brings its rated capacity to 22,650 kw. The basic design of the station is for a plant with a capacity of up to 60,000 kw.

A City-School Park Program

By **JOSEPH D. RODOTA**
Director of
Recreation and Parks
San Rafael, Calif.

In San Rafael, Calif., both the city government and the school district have participated in a joint sponsorship of the recreation program under contractual arrangements for several years. The use of school buildings and facilities, along with some financial support by school districts, has made the community recreation program a success.

However, with only five public parks and many undeveloped school grounds, we lacked adequate active recreation areas. The number of improved recreation areas for athletics, sports, field games and playground programs simply was insufficient to meet the many demands. Youth baseball groups, involving hundreds of youngsters, adult interest in softball, semi-professional baseball, cricket clubs, youth football interests, and many playground activities that involved the use of these active recreation areas were some of the demands being placed upon a limited number of facilities.

Several attempts made by the city to acquire suitable lands met with many obstacles. The limited lands that were available bore premium price tags and huge development costs. The problem still remained.

To solve this, the city organized a committee composed of a city councilman, the Chairman of the Recreation and Park Commission, the Recreation and Park Director, and representatives of various youth and adult groups. This committee suggested developing existing school grounds for these recreation areas. The members reasoned that the school grounds were unimproved but the land was there, and the city, lacking land, could possibly expend funds for their development.

Both the school board and the city council responded favorably.

The proposal, developed by the Superintendent of Schools and the Recreation and Park Director, included:

- **A three-year program for the improvement of four sites.**
- **A two-acre development at a junior high school, centrally located in the city, and one-acre developments at two elementary schools and the senior high school.**

Each site is being developed jointly, as follows:

Turf development. The school district provides the top soil and the city assumes the cost of hauling and grading it. The city provides the sprinkler-system materials with the cost differential between an automatic and manual system absorbed by the school district. The city purchases all seeding materials and fertilizers. The school district installs all backstops and permanent fencing with the city providing bleachers and other necessary items of equipment. The sprinkler system is automatic, utilizing Amco plastic pipe and incorporating Buckner gear-driven rotary pop-up sprinklers (full circles and part circles) and controlled by the Moody Rainmaster Automatic Controller.

Installation, labor and maintenance. The school district, in cooperation with the city recreation department, is responsible for design, layout, and general supervision of the developments.

The school maintenance staff provides the labor involved in planting turf and installing the sprinkler systems with cooperation rendered by the park department, which supplies men to the maintenance crew for the required period.

When the areas are developed, school crews will provide maintenance the year round with 25% of the total costs contributed by the city based on an average yearly use of the areas.

Utility costs. These are assumed by the school district.

The new areas will enjoy maximum utilization. The schools will have sufficient areas for their physical education programs, school-season recreation programs and free-time activities. The city recreation department further uses all areas in the after-school recreation programs, Saturdays, Sundays and holidays, for supervised recreation in conjunction with the use of school buildings and facilities.

The fields will be used extensively for touch-football leagues, softball, field games, youth football and other activities. During the summer months the areas are utilized by the recreation department as full-time neighborhood playgrounds. The developments provide sufficient area for the many Little League, Pony League, and other youth leagues, along with other groups that find such areas desirable.

The city's total capital outlay is only $16,000. However, to duplicate the improvement of the four recreation areas would require approximately $150,000 including land acquisition and minimum developments. The schools, on the other hand, have realized ground improvements with a minimum expenditure, and the total community has benefitted. ◄◄

The author, left, confers with School Buildings and Grounds Superintendent William Barlow, right, and Park Foreman Charles Pinea on plans for a park-school recreation area.

This street had to be barricaded every spring. It was one of the first roads treated with rubberized asphalt in May and June 1955. Photo was taken in April 1956.

The same street after shoulder widening and re-sealing. The base held up under severe stress during construction of the school. Photo taken from same spot but in August 1960 (note large tree at left).

Good Streets for Little Money

Six years of experience prove value of rubberized asphalt emulsion for surface treatment

By **C. W. BEAGLE***

Where natural soils provide for the required sub-surface drainage and will compact to a hard surface, they can be stabilized with medium-curing asphalt and weather proofed with rubberized asphalt emulsion to provide a durable, long-lasting and serviceable low-cost pavement. A five-year paving program covering 122 streets in South Plainfield, N. J., (a total distance of 21⅕ miles) proves this point.

We used rubberized asphalt emulsion for the first time in 1955 (THE AMERICAN CITY, October 1956, p. 11), and these same streets were still giving excellent service in 1960. During the winter of 1956-1957 one of these streets took a severe beating from heavy trucks and bad weather but it stood up well under this unexpected test (THE AMERICAN CITY, July 1957, p. 11). To provide parking for a new school our 1959 program called for treating the shoulders to make the street 40 feet wide, followed by a seal coat over the entire width.

Over the five-year period we made some variations in base preparation but the original soil proved best. Failure occurred on streets where bank-run gravel was tried as a base. This we attribute to the inconsistency of particle sizes and variations in clay percentages in the gravel.

We also tried a by-product from the manufacture of roofing granules known locally as "#20 fines." In this material the medium-curing asphalt penetrated only about ½ inch. However, our experiments did show that with the "fines" the rubberized asphalt emulsion made a weather-tight surface. Cutting the surface after one year of service showed that the "fines" below the penetration were dry and flowed like sand. This condition permitted movement under traffic and caused spot failure.

The original soil varies from shale to a sandy loam, with some clay in spots. Where hard shale and clay were present, we applied a two- to

Treated in June and July of 1956, this street, during July 1960, served as the route over which a fleet of 14-yard dump trucks hauled 10,000 cubic yards to fill. This picture was taken in August 1960.

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*As Borough Engineer-Director of Public Works for South Plainfield, N. J., the author supervised all work described in this article. Recently Mr. Beagle left South Plainfield to accept the position of Borough Engineer for the Borough of New Providence, Union County, N. J.

three-inch cover of ¾-inch road stone and rolled it before applying the rubberized asphalt emulsion, grades MC-1 for the sandy surfaces and MC-0 for the more dense surfaces. In some cases we used a blend of the two grades.

Application varied from 0.3 to 0.4 gallons per square yard. We did experience a small percentage of failure in this type of base where proper allowance was not made for clay or shale.

The seal coat consists of emulsified asphalt, grade RS-1 with rubber additive, applied at the rate of 0.3 gallons per square yard. This was covered with 20 to 22 pounds of cover stone per square yard.

For the 30-foot-wide streets, material costs for maintenance per mile per year amounted to $83 for the past five years. This same cost is $68 for the streets constructed during the past three years.

Seal coating costs $1,320 per mile for materials. At the end of five years only seven of the 122 streets surfaced required a second seal-coat. The 1% rubber additive in the asphalt emulsion adds about $160 per mile to the material cost (the $160 is included in the $1,320 figure).

Average Cost

The average cost of material per mile to construct the roads over the five-year period was $4,502. This includes all base stone, cover stone, rubberized asphalt and medium curing asphaltic oil. Streets requiring no base stone averaged $4,024 per mile.

After five years it is still possible to pull a strand of rubber in the pavement up to ½-inch in length, showing that as little as 1% of rubber additive lends flexibility to the pavement. Applications made one year ago will pull a strand of rubber up to 1½ inches in length.

Rubberized asphalt emulsion provides a surface equal to the diameter of the cover stone in thickness, is weather tight and flexible enough to prevent cracking from temperature changes or loads from traffic. They require no more maintenance than a six-inch penetration road in this locality. ◄◄

Philadelphia Wins Improvement Award

Philadelphia is the winner of the first Ward Melville Gold Medal for community improvement. Two other communities, San Jose, Calif., and the Town of Washington, Conn., were awarded certificates for their outstanding accomplishments in community improvement.

The jury for the 1960 Gold Medal was composed of James Grote Van Derpool, Associate Dean, School of Architecture, Columbia University; William S. Foster, editor of THE AMERICAN CITY; Richard E. Reuter, executive director of CARE, Inc.; and Arthur Paar, realty consultant to the Melville Shoe Corporation.

Philadelphia's entry in the national competition cited the decay of the city and the flight of residents and business prior to the present gigantic undertaking, which, at one point, comprised about half of all of the community enterprises in progress in the entire country.

It noted the replacement of the old Broad Street Station by the present Penn Center; the "city-within-a-city" development rising on former swampland; the $100 million Food Distribution Center replacing the decrepit food markets on Dock Street and on the site of the old, noxious city dump; the restoration of some 500 historic homes in the Society Hill-Washington Square district which is luring families back to the city center as well as preserving history; the renovation of public shrines and the improvement of their surroundings; and, among numerous other projects, the development of the Schuylkill Expressway, helping to free parts of Philadelphia from traffic strangulation. ◄◄

Winter Concreting Idea

To pour concrete in cold weather, municipal crews can borrow an idea from the Bar-Tel Company of Muncie, Ind. This contractor used a "bubble" of Visqueen polyethylene film to cover freshly-poured concrete slabs. The procedure used consisted of anchoring 2x4 plates to the wall forms, partially unrolling the film, securing it to the plate with lath or 2x2's, and then unrolling the film over the slab. Unrolling against the wind keeps the film-bubble inflated and away from the concrete.

After securing the other side and both ends in the same fashion, the contractor then connected a 26-inch down-flow oil-fired furnace to it. A blower kept the bubble at a height of about two feet above the concrete at the center. A short sheet-metal duct funneled the warm air from the furnace to the bubble. A small hole at the opposite end of the furnace prevented air pressure from building up too high and pulling it loose.

The film, a product of the Visking Company, Division of Union Carbide Corporation, is clear and only 0.006 inches thick. However, its moisture-proof quality protected the pour from inclement weather and aided in the proper curing of the concrete.

By adjusting the nailing strips, raising or lowering of the bubble is made possible, which, in turn, allows workers to get under the cover with a troweling machine if it is necessary. ◄◄

A plastic bubble lets concrete work continue through the winter.

City-County Planning

. . . produces results for Kokomo, Ind., and Howard County and cuts planning costs in half

By **JAMES R. BUTCHER**
Planning Director

Kokomo has been in the planning business since 1925. At that "pioneering" date it energetically formulated and enacted planning and zoning legislation but, after the first spurt of energy, the novelty apparently wore thin and the original ordinances, plans and maps were relegated to a high shelf, there to repose and gradually gather dust.

In 1948, however, the Junior Chamber of Commerce decided that an active planning program was just what Kokomo needed. The JCs organized a spirited drive and shortly thereafter aided in the enactment of a new zoning ordinance. The city soon appointed a planning commission and under its direction, a planning staff was hired and planning really "came alive." In the next few years, the city adopted a Master Plan, consisting of a zoning ordinance, a thoroughfare ordinance, a subdivision-control ordinance, and finally a trailer-court ordinance.

This did not come about after the first clarion call of the Chamber's trumpet, however, for it took careful planning and much good, hard work. The first step, a very important one, put the program under the guidance of professional city-planning consultants. Then the Planning Commission realized that in order to have a healthy active planning program, the people had to know what it was all about, and how it would benefit them and the community as a whole.

Whenever and wherever a group could be found to listen, the Planning Commissioners or members of the planning staff would explain the program, point out the advantages and answer questions. True, this original effort did not provide completely smooth sailing, but it did begin to gain acceptance as a worth-while program. The city government recognized that a planning commission, because it deals with abstract ideas, would be open to attack. Therefore, the Mayor was careful to appoint members who are competent, objective in their approach and able to stand up to the opposition that is leveled at them and their work.

Care in selecting members has paid off. Although they serve without pay, members' attendance has been so good that not once has a meeting been postponed due to the lack of a quorum. One member, Donald Snider, served on the Commission continuously from 1948 until January of this year, eight years as a citizen member and four years as the City Council representative. In 1959, the Planning Commission actually spent eight hours more in session than did the City Council.

Another element that has contributed to community acceptance has been the way in which the Commission has welcomed the press to its meetings. As a result, the program has had good press coverage. This, too, has been a vital factor in gaining and retaining public support.

County Cooperation

Like many another city, Kokomo is surrounded by a suburban area with a mounting population. In 1955, this area, the rural element of Howard County, recognized that it needed help in planning for the growth of this burgeoning community. Thus, after many township public hearings, a master plan for Howard County was adopted.

This in itself is not unusual but when the Kokomo City Plan Commission, the Kokomo City Council, the Howard County Plan Commission and the Howard County Board of Commissioners sat down together, they made news by adopting a series of resolutions which provided for a joint planning staff. Suitable quarters were found with the city paying 40% and the county 60% of the cost.

This step has been a real boon to the whole area's planning operation. Because the staff is larger and facilities better it has provided a broader scope to the planning activities. We were able to spend $18,000 to remodel the office space and purchase a nine-passenger station wagon.

Aside from the better planning program made possible by this arrangement, the increased under-

CITY-COUNTY PLAN COMMISSION
KOKOMO HOWARD COUNTY, INDIANA

Six members of the City-County Plan Commission prepare to leave on an inspection tour. Left to right, they are Raymond Lamberson, Earl Hemmeger, D. James Pickett, Walter Mead, Ralph Mitchell, and the author.

standing and cooperation between city and county officials brought about by this step has been most heart-warming. This understanding has also helped promote acceptance of the planning program, for the goodwill thus generated has spilled over into the community.

To coordinate the planning of the two commissions, a member from each sits in on the other's meetings in an advisory capacity. This liaison has proved to be effective in improving efficiency and not only has time and effort been saved but cost has been greatly lowered. This has been especially apparent in the realm of streets, highways, subdivisions and zoning. The most recent result of city-county planning operations was the acquisition of a 180-acre site by General Motors Corporation for the development of transistors. The property was zoned as industrial reserve and bordered by four major thoroughfares and a railroad, all due to planning.

Requests for copies of the planning ordinances have been received from throughout the country and a recent letter came from Guam.

Costs Halved

One unusual result of our cooperative planning program has been the rarity of complaints about the expense involved. The reason for this is that the actual costs are about half what they would be had each unit undertaken its planning program alone.

Both city and county have a zoning ordinance, a subdivision control ordinance, a building-permit ordinance, and a thoroughfare ordinance. The city's zoning ordinance is being completely up-dated and is now in the public-hearing stage.

Many segments of our program remain to be completed. These include a park-development-plan ordinance and a master plan for school expansion. As our work expands additional help must be added. The proposed 1961 budget includes an appropriation to hire a zoning administrator. When this is done our staff will total five people.

Although our program is far from complete and we are still making mistakes, Kokomo and Howard County are both growing steadily in a healthy and orderly manner. The city and county taxpayers are getting efficient government, due, at least in part, to the success of the cooperative planning program. ◄◄

Renewal Housing Has Aluminum Construction

A $4,000,000 city-sponsored cooperatively owned development of apartments and town houses is under way in Cincinnati, Ohio. It will provide 323 residential units on a 12.7-acre tract. The development will be known as the Park Town Cooperative Homes. It is being built by Reynolds Metals Company under a contract awarded by the Cincinnati City Council.

Vice-Mayor Walton H. Bachrach led a group of dignitaries who turned up the first earth. Joining him in wielding ceremonial shovels, appropriately made of aluminum, were David Walker, Commissioner of the Federal Urban Renewal Administration; Albert M. Cole, former federal housing administrator and now executive vice-president of Reynolds Aluminum Service Corporation, City Manager C. A. Harrell, Urban Renewal Director C. H. Stamm, former Vice-Mayor Theodore M. Berry, representing the cooperative organization which will purchase the Park Town project upon completion; and Edward C. Gabriel, local Federal Housing Administration director.

First units in the Park Town Cooperative Homes are scheduled to be ready for occupancy during the spring of 1961, and full occupancy is expected by the fall of 1961.

The homes were designed by Doxiadis Associates of Washington, D. C. Consulting architects were Pepinsky, Grau, Schrand and Shorr of Cincinnati.

Two types of residential units will be built: "maisonettes" and town houses. The 24 maisonette units will each house eight families. Twelve will contain four efficiency apartments and four two-bedroom apartments. The other twelve will contain four one-bedroom apartments and four three-bedroom apartments. The two- and three-bedroom units will each have private balconies.

Of the town houses, 95 will be two-bedroom and 36 will be three-bedroom. All the apartments and town houses will be sold to occupants through Park Town Cooperative Homes, Inc., a local nonprofit co-op organization. The average down payment required will range from about $250 for the efficiency apartments to $650 for the three-bedroom town houses. Monthly carrying charges will range from about $70 for efficiency apartments to $100 for three-bedroom town houses.

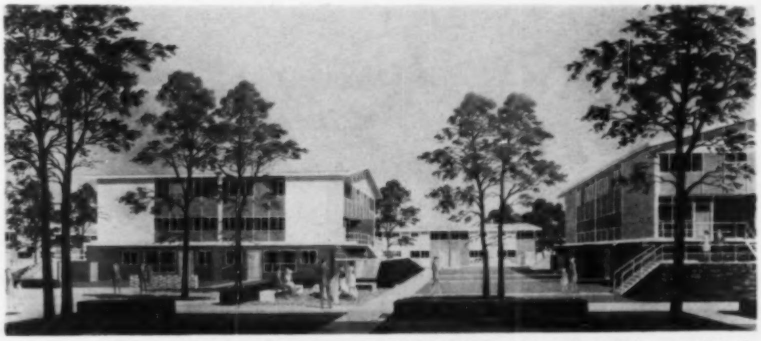
The structures, completely fireproof, will utilize aluminum in combination with masonry. Light tan aluminum roof shingles will be used on all buildings.

There will be a two-story community building which will contain the offices, a community recreation hall, laundry facilities and storage rooms.

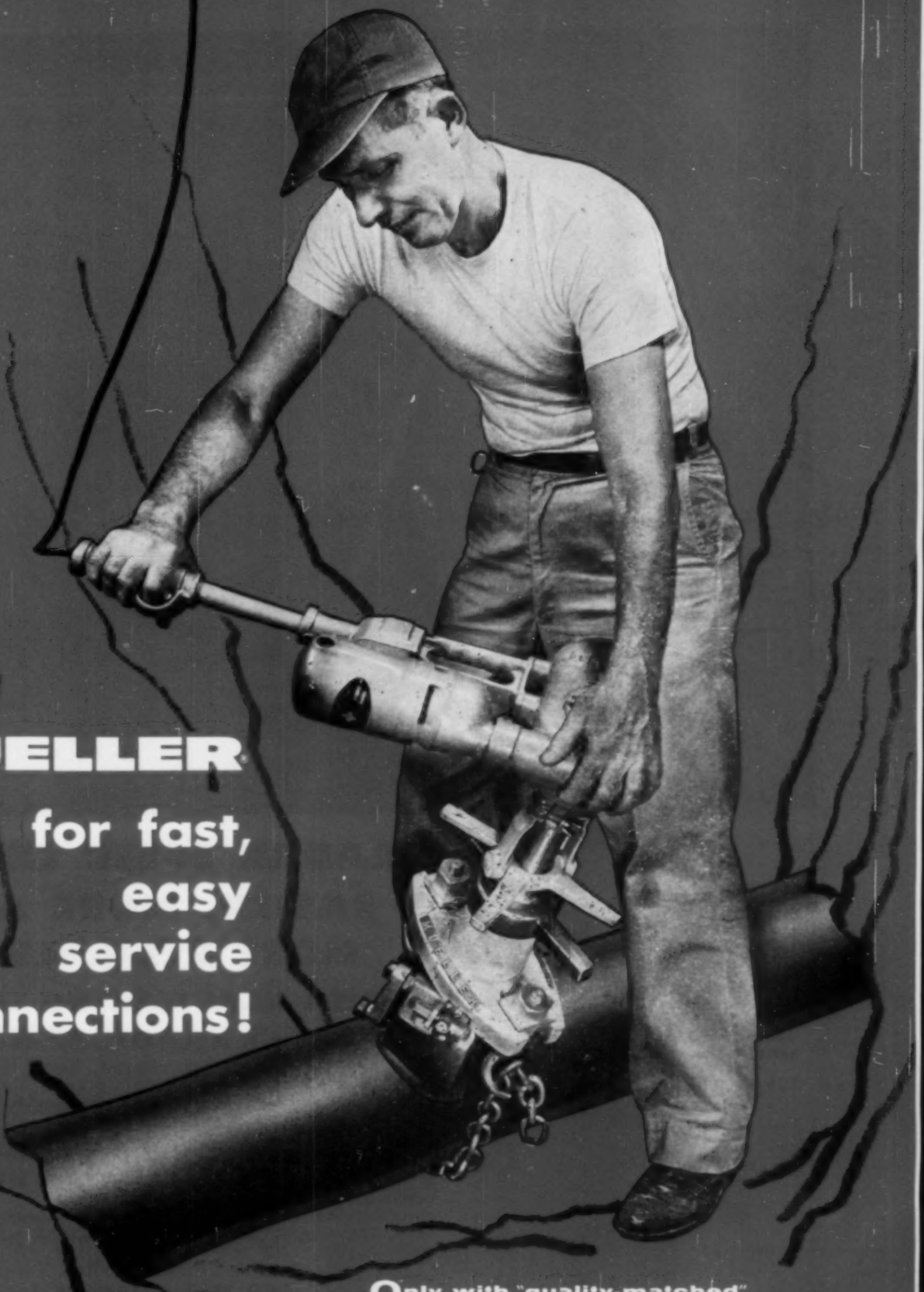
Playgrounds with equipment for toddlers will be placed throughout the area. On an adjoining site, a municipal park will provide a playground and a swimming pool.

Prime contractor for the project is Jewell Builders, Inc., of Columbus, Ohio.

The Park Town Homes are being built under a contract awarded by the Cincinnati City Council to Park Town Corporation One. This corporation was established for this specific development by Reynolds Metals Co., Richmond, Va., and Honor Corp., Columbus, Ohio. ◄◄



The new cooperative will look like this when it is completed.



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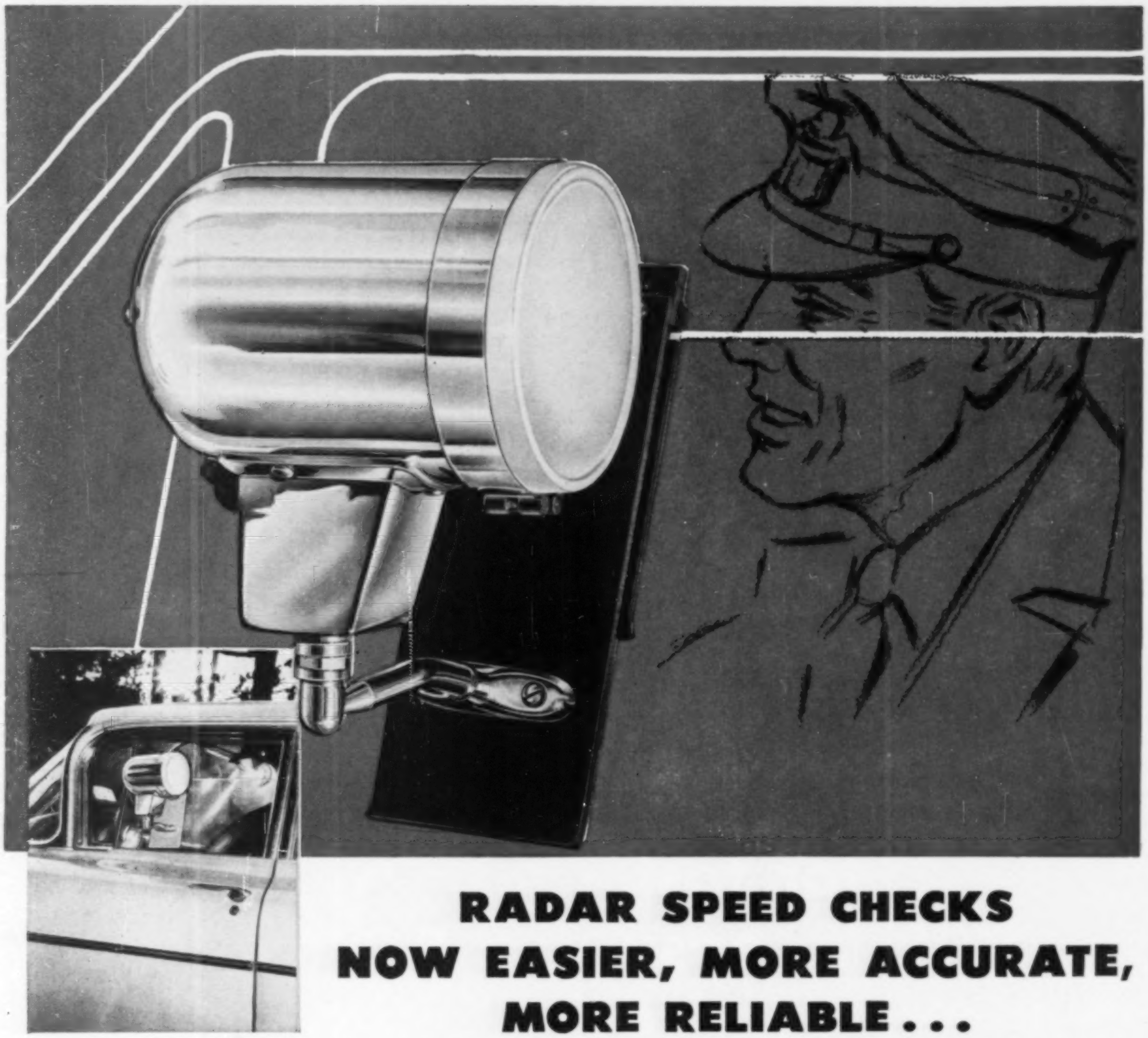

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AUTOMATIC SIGNAL DIVISION

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ELECTRO-MATIC CONTROL

Corona del Mar State and City Beach Park in Newport Beach, Calif.

Newport Beach's Parking Policy

By **THOMAS H. CHILDS**
Assistant to the City Manager

Newport Beach, Calif., is an attractive beach community located on the coast of the Pacific Ocean between Los Angeles and San Diego. Its winter-time population of 26,000 swells to several times this number during summer months. This creates a parking shortage.

Two other factors contribute to Newport Beach's summer parking problem. Its unusual geography results in six separate business areas, each different in terms of traffic and parking congestion, and the merchants' views of what constitutes reasonable levels of parking enforcement.

Secondly, the summer parking shortage extends to the residential sections of town that are adjacent to the city's 7½ miles of public beach. Vacationers flock to these areas and park their cars in the already limited number of on-street spaces, often with the result that the year-around residents and their guests must park their automobiles some distance from their homes. During the summer months in one residential section abutting a beach, parking is limited to one side of each street. This approach to parking and traffic control was initiated by the residents and is now an accepted practice.

Local Laws

By resolution, the City Council has designated the areas where parking meters are located, what the hourly rate in each area is, and what months of the year the meters are to be in operation. Three of these areas have been denoted as revenue-producing "recreational parking areas" and the hourly parking meter rate is 10 cents (281 meters), as compared with 5 cents in the other metered sections (945 meters). The rationale, as stated in the resolution, is that " . . . paid parking in recreational areas is one of the few practical means of recovering a portion of the cost of city services (e.g., beach cleaning, lifeguards, traffic control, etc.) enjoyed and necessitated by visitors." This represents a departure from the conventional view that parking meters are installed only to stimulate curb parking turnover.

Newport Beach has 1,226 parking meters manufactured by the Dual Parking Meter Co. Coins from parking meters are collected by two parking-meter servicemen employed by the Public Works Department. They drive two Chevrolet pick-up trucks for making minor meter repairs and adjustments in the field. One of the trucks has a hydraulically operated tail gate that swings down to permit the heavily laden coin carts to be loaded on to the truck's bed.

Once each day these men take the coins they collect from the meters directly to a local bank where they are counted on a Standard Johnson Co. Model F-1 coin counter owned and maintained by the city but operated by the bank. The bank then submits a deposit slip to the city's Finance Department.

Major parking-meter repair and overhaul operations are performed by a parking-meter serviceman who also serves as field supervisor of the two coin collectors.

Revenue from the city's parking meters and two

(Continued on page 121)

Parking-meter serviceman George Cooke loads a coin cart on the meter-service truck's hydraulically operated tail gate; the tail gate is manufactured by the Master Vibrator Co., Dayton, Ohio. Boxes on the sides of the truck contain spare parking-meter heads and parts for making field repairs. The truck has a Motorola utility radio.

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Ideally suited to residential areas, school crossings, small shopping centers, etc., the MP-120 offers significant savings over more expensive neon units designed for crossings up to 125′ in width.

The "Walk/Don't Walk" legends and the rectangular shape of the signal distinguish it instantly as a signal for pedestrians . . . impossible to confuse with circular signals for vehicular traffic.

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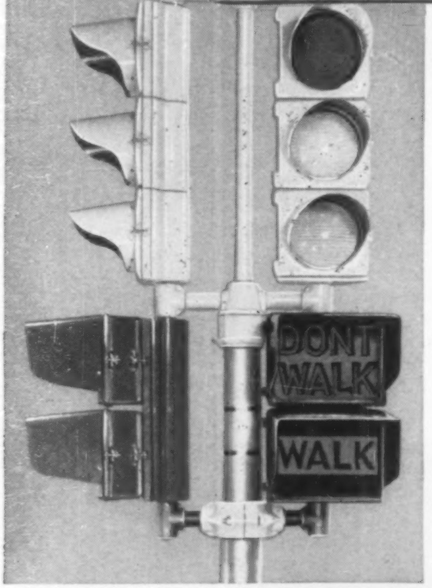
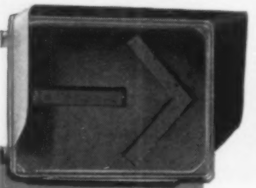
For engineering and service assistance, Crouse/Hinds maintains a nationwide network of sales engineers and distributors to assist you in engineering and service situations. For the name of the Crouse/Hinds representative nearest you, call or write any branch office.





ABOVE — MP-120 Installed on Standard Signal

RIGHT—Arrow for Vehicular Use MP-110

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(Continued from page 119)

off-street unmetered lots (for which a flat daily parking fee is charged) goes into the city's parking meter fund. It is used for traffic engineering, off-street parking, site acquisition and improvement, and parking control.

As indicated above, the city has two parking lots for which a flat daily parking fee is charged during the summer months only. One of them is located at the Corona del Mar State and City Beach Park—a beach area within the city owned by the State of California and leased to and operated by the city on a long-term lease basis. The parking charge is 50 cents on weekdays and $1 on Saturdays, Sundays and holidays. There are 600 parking spaces. The park attendants responsible for the operation and cleaning of the lot are employees in the city's Parks, Beaches and Recreation Department.

Hunting License

Gross parking revenue from the Beach Park for 1960-61 is estimated to be $51,200 and, in accordance with the city's lease with the state, may be used only for city-wide park and recreation purposes.

An interesting sidelight to the Beach Park operation is the pass system that has been in effect for two years. Newport Beach residents and out-of-towners alike may purchase through the Finance Department a $7.50 yearly vehicle pass. In reality it is a "hunting license," since it entitles the possessor to look for a parking space in the lot without having to pay the daily fee, but it does not reserve a space for him.

A motorist who has received an overtime parking citation may either post bail at the Police Department or mail a dollar bill to the court in the envelope inserted for this purpose under the windshield wiper. The $1 bail schedule was established by the local municipal court and applies to both 5-cents- and 10-cents-per-hour meters. Approximately 87 cents of each $1 collected through bail forfeitures and fines is returned to the city.

Until a year and a half ago, regular police officers were assigned to the relatively routine task of parking enforcement. This was an unproductive and expensive use of professionally trained police manpower, so in February, 1959, two, and later three, female parking-control officers were employed by the Police Department. The qualifications for employment include previous experience in a public-contact job, high-school graduation, age 21 to 31, and good physical condition. The current monthly pay is $352 to $428 and is 20% less than that of patrolmen.

Immediately after being employed and prior to assuming their enforcement duties, the parking control officers participate in a two-week Police Department training program. It includes briefings on the purpose of parking meters and restricted-time parking, state and local parking regulations, public relations generally and relations with over-time parkers specifically, points of interest in the city and location of city offices. The girls also are instructed in office procedures in order that they can act in a clerical capacity during inclement weather.

The parking-control officers patrol their areas on foot or on three-wheel West Coaster Traffic Masters sold by Borg-Warner Corporation, Ingersoll Kalamazoo Div., Kalamazoo, Mich.

Experience thus far in Newport Beach has shown that parking-control officers, unlike most patrolmen, do not "look down" on parking enforcement as an assignment. In addition to substantial salary savings, the women are preferred by merchants and motorists.

Police Cadets

During the past three summer seasons, the city has employed as police cadets a number of senior and graduate college students majoring in police science. They are uniformed, deputized, and armed. Their principal job is to supplement the parking-control officers in parking enforcement, although occasionally they are assigned to the city's non-uniformed beach patrol and to routine follow-up investigations in the Detective Bureau (e.g., tracing the owners of bicycles, etc., recovered by the Police Department).

Besides meeting the city's seasonal need for the additional police manpower, the police cadet program has improved the city's recruiting efforts for year-round patrolmen. One former police cadet, a graduate of the University of California's School of Criminology, is now employed as a patrolman and others have expressed interest in returning to the Police Department after they obtain their degrees. ◄◄

Parking Control Officer Margery Mustard and her West Coaster Traffic Master patrol vehicle. The substitution of women for patrolmen for parking control has lowered costs and raised the level of enforcement.

Plastix channels the heavy traffic on Pittsburgh's Ohio River Boulevard.

Mr. Rankin (standing) and Prismo men study the traffic line.

Pittsburgh Reports On Plastic Markings

Prior to 1959, Pittsburgh, Pa., had only about 12,000 feet of plastic materials in place as lane and center lines and 4,000 feet as crosswalks. This material ranged from plastic discs, squares and strips to hot extruded marking materials. It had all been put down on a semi-experimental basis to determine what products were best suited for our street and traffic conditions and what application methods were best suited to our working conditions.

At the start of the 1959 pavement marking season, we had narrowed the field of plastic materials to the following:

1. **Pressure-sensitive reflectorized strip plastics.**
2. **Non-reflectorized strip plastic requiring the application of a mastic to the street. This mastic is applied by normal pavement-marking equipment.**
3. **Hot extruded plastic-marking material, applied by a contractor.**

In 1959, a total of 26,000 feet of plastic of these three types was used in equal amounts. In 1960, the total quantity of plastic used was substantially increased.

On streets where traffic movements require 365-day-a-year pavement markings, Pittsburgh is aiming for 100% plastic marking coverage. I realize it will not be possible to reach this objective, for it will be difficult to decide exactly which streets fall in the category of requiring 100% marking coverage. However, an example would be the Ohio River Boulevard. This street carries very heavy volumes of traffic all year long and the lane markings are essential for efficient traffic control.

Ohio River Boulevard was marked this year with 14,000 feet of four-inch white reflective Prismo "SD" Plastix, which was used for a double center line and lane lines from California Avenue to the McKees Rocks Bridge and as lane lines only from the bridge to the city line. In addition to the year-long service of plastic markings, they have the advantages of economy and application with minimum traffic interference.

Two and three paint applications a year over a three- to four-year period eventually cost more than a single plastic application. Therefore, if we realize a three- to four-year life from our plastic we should make an ultimate cost savings. A direct savings along this line is the freeing of manpower from the task of repainting.

There are many streets in Pittsburgh where we must eliminate all parking 24 hours ahead of any paint work if we are to expect drivers to stay off our new paint lines. This requires a considerable use of police man-hours and often the presence of illegally parked cars seriously restricts and even prevents paint work.

Plastics now can be quickly applied, without special equipment or skilled labor. Traffic flows can continue while the installation is being made, ending long waits required by other marking materials to dry or set.

Pittsburgh's paving-marking program covers the marking of center lines and lane lines on 106 miles of arterial street and the marking with one or more crosswalks of about 850 intersections. It requires placement of 125,000 feet of material for crosswalks and 385,000 feet of material for lane and center lines. Total paint requirements for the year are about double the amount required for marking the above, as every effort is made to cover all paint work at least twice each year.

Our painting program is a bare minimum for the city. With increased use of plastic we expect to reduce the repainting needs and thereby to have more manpower available for the marking program.

WOODROW W. RANKIN
City Traffic Engineer

Patented

Vandalism and theft go down when WIDE-LITES go up!

Police records show that proper floodlighting cuts robberies by as much as 65% . . . reduces vandalism . . . slashes juvenile delinquency. And a quick check of the Wide-Lite Protective Light's anti-vandalism features proves it is the ideal floodlight to protect schools, storage areas, jails and public buildings.

Its exclusive design features a mercury-vapor lamp plus two incandescent lamps to provide maximum light output. Any one of the lamps will continue to give protection even if the other two are knocked out. And its special tempered glass lens and rugged cast aluminum body protect the lamps from breakage.

Wide-Lite's exclusive rectangular reflector gives a broad light pattern that makes possible shadow-free lighting with fewer floodlights, saving installation costs. Maintenance, too, is low, because lamps used in Wide-Lite Protective Lights have many times the life of ordinary incandescents.

Get all the facts on how Wide-Lites can give your city more protection against vandalism and theft—send the coupon today!

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WIDE-LITE CORPORATION

P. O. Box 191 · Houston 1, Texas

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OUTDOOR AREA LIGHTS · VAPOR TITE MODELS · INDOOR LUMINAIRES
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TALKS
ABOUT
THE
WEATHER...
...but DUNCAN
performance is unaffected!
YOUR TIME LIMIT
TIME EXPIRED

Specifically engineered and tested to take the severest of inclement weather in stride. Duncan "heavy-duty" meters offer low-cost, efficient parking control regardless of the season.

"Three-second" lift out mechanism provides for the fastest mechanism exchange possible, greatly facilitating maintenance programs under all conditions.

"Hundreds of cities have traded their "fair-weather" meters for "all-weather" Duncans. Check the operation of your city's installation today.

DUNCAN PARKING METER
DIVISION OF NAUTEC CORPORATION
835 NO. WOOD STREET • CHICAGO 22, ILLINOIS

It Counts Vehicles And Regulates Lights

The blurred image is a fast-moving car in Denver but it has been counted by the overhead box. Moreover, the box not only detects and counts cars by infrared rays but also tells the traffic lights when to change.

The device, called Traffitrol detector (Model D-101) is manufactured by the Heiland Division of Minneapolis-Honeywell Regulator Co., 5200 East Evans Ave., Denver 22, Colo. ◄◄

Traffic Needs Dictated in the Field

The Investigation Section of the Traffic Engineering Division of the Seattle Engineering Department has for some time used portable dictating equipment in conducting field investigations of the 3,000 complaints and requests pertaining to traffic matters each year. Power for the machine is obtained through a plug-in connection from a converter to the cigarette lighter of the vehicle.

The use of the dictating machine for field inspections is a saving in both time and efficiency. During the investigation of an intersection and/or area a complete word picture can be made in just a few seconds, making unnecessary a return trip to refresh the memory, and also relieving the field investigator from having to rely on his memory when writing a report in the office.

Orders for traffic installations are dictated on a Dictet, manufactured by the Dictaphone Co., 730 Third Ave., New York. Dictation is on the spot, making it easy to locate the place, without relying on hurriedly scribbled notes.

E. E. Lewarch
Traffic Engineer
Seattle, Wash.

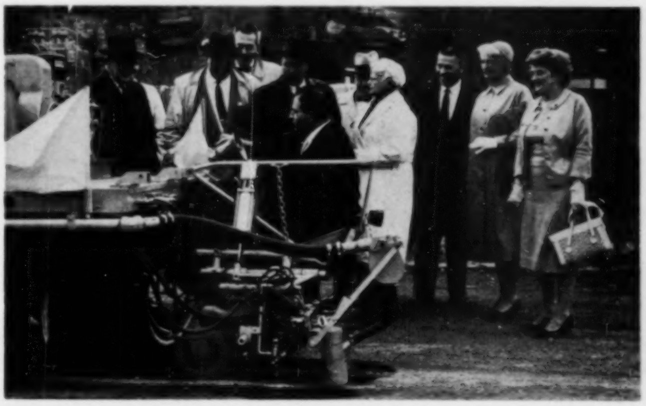
Youngstown Doubles Its Striping Ability

Fast pavement striping needs a big machine as well as one with the latest wrinkles. With our new Statesman liner we accomplish the city's annual marking program in less than half the time formerly required, with the same or less manpower. We still operate our smaller Wald machines in areas not presently striped and use them to increase our pedestrian crosswalk program. Our small units have only two spray guns. Our new machine can put down three lines simultaneously, using both white and yellow.

Soon we will be marking 15 to 18 miles of dual expressway and also the city's airport runways. In the past, striping of the visual approach runway has been done for the city under contract, while the two instrument runways were striped by the Air Force. Now we can mark all of the runways without using contractors.

Youngstown marks its streets with two colors, white and yellow. It puts down about 500 to 600 miles of line a year, including some heavily traveled streets that are marked twice a year.

John F. Pletnik
Traffic Coordinator
Youngstown, Ohio

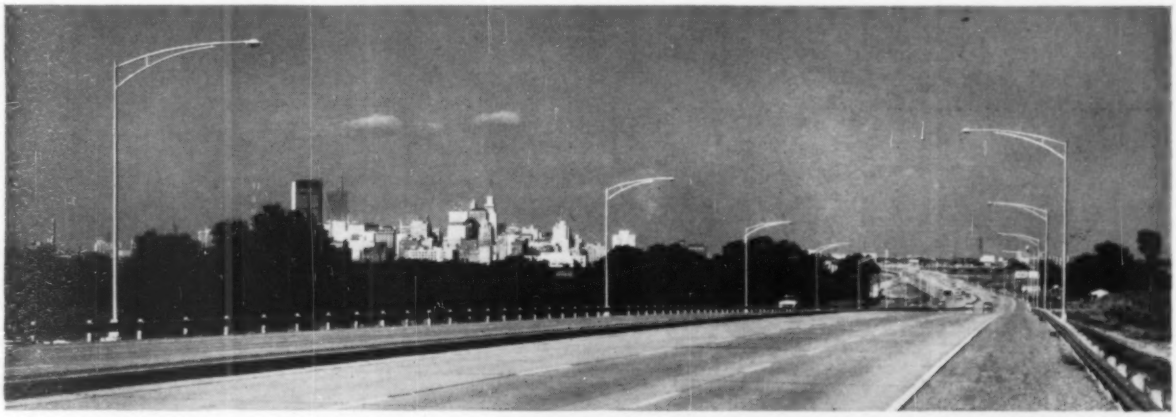


Youngstown's City Commissioner of Engineering, J. P. Richley, operates the push-button controls of the city's new Wald Statesman striping machine with help from John F. Pletnik, the city traffic coordinator. Looking on are Councilman Michael McCullion, other city officials, members of the Youngstown Safety Council and traffic engineers from Cleveland, Ohio.

MONOTUBE POLES in steel or aluminum

. . . engineering and styling to meet today's rigid outdoor lighting requirements

Business District Lighting



Highway Lighting

Residential Lighting

Area Lighting

UNION METAL

THE UNION METAL MANUFACTURING COMPANY
Canton 5, Ohio **Brampton, Ontario**
Monotube Engineered Lighting Poles

The lighting is modern on the Bronx-Whitestone Bridge over New York's East River.

Some of the Best in Street Lighting

By **H. C. MAYER**
Outdoor Lighting Specialist
General Electric Company

By the time you have read this article, six people will have died in an automobile accident! Every 18 seconds a major crime is committed in the United States—most of them at a time when darkness serves as a veil. Within the next 12 months approximately 21,000 persons will be killed between dusk and dawn.

It is usually conceded that night-time traffic deaths and accidents can be reduced by 50% by adequate street lighting.

If someone told you that you could cut your home heating bill in half by installing some new "gimmick" you would certainly look into it. If you heard about a new "gimmick" that would *double* your gas mileage you would surely try it out.

Well then, the trouble in street lighting is that there is no gimmick available. So, let's take a tour through the United States and see for ourselves how the fine examples in street and highway lighting came to be.

Chicago's famed State Street still remains the best in downtown lighting. This 15-footcandle installation must be seen to be understood. On each pole there are mounted four fluorescent luminaires generating a quarter-million lumens of light. The State Street Merchants' Association wanted the "world's brightest street." They got it and State Street took the crown away from 69th Street in Upper Darby, Pa., a suburb of Philadelphia where a 1,000-watt mercury-vapor lighting system also turns night into day with a clear, crisp eight footcandles. How long State Street will retain the crown is problematical for other "prestige streets" in America are studying upgradings.

In Yonkers, N. Y., Getty Square is lighted to about the same level as Upper Darby with 1,000-watt mercury lamps and luminaires.

Only a few years ago Kankakee, Ill., startled many with a five-footcandle installation. Upper Darby almost doubled this in less than a decade and State Street tripled it. Technology continues to advance, making these higher levels more practical and feasible.

Let's move away from "Main Street" now to some of our traffic arteries where traffic accidents are always a menace. ASA Standard calls for only about a footcandle, yet less than an estimated 20% of this type of street meets this figure. 38th Street in Indianapolis is an excellent exception. It is lighted with four-lamp fluorescent luminaires.

In Denver, Colo., as well as in other cities, relatively narrow streets passing through residential areas have been converted into effective, and safe, high-capacity traffic arteries by being well lighted.

Bayshore Boulevard in Tampa was made safer by

(Continued on page 129)

New York City's Bronx-Whitestone Bridge is lighted with 137 400-watt General Electric white mercury-vapor luminaires. They are installed down the center of the mall with 100-foot spacing. The mounting height is 25 feet and the light level 1.6 to 1.7 footcandles. The Jefferson Electric Co., Bellwood, Ill., supplied the ballasts.

EXPIRED
5 10 15 20 25 30 35 40 45 50 55 60
1 HOUR
EXPIRED
60 MINUTE LIMIT
EACH PENNY — 6 MINUTES
EACH NICKEL — 30 MINUTES
ONE DIME — 60 MINUTES
09510

you know this face

IF YOU ARE ONE OF . . .

105,000,000*

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PARK-O-METER COMPANY
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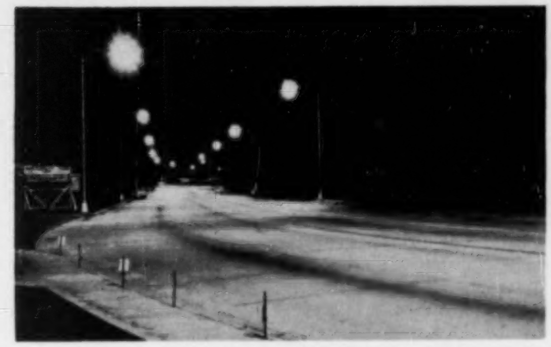


G. E. 20,000-lumen mercury-vapor lamps, 30 feet up on Kerrigan steel poles, light Bayshore Boulevard, Tampa, Fla.

Fluorescents, 29 feet up, light Abendroth Avenue, Port Chester, N. Y., and a municipal parking lot at the left.

(Continued from page 127)

400-watt mercury lighting; there were no deaths the year after relighting but three the year before.

Brookings, S. D., a community of 8,000, removed all the old-fashioned street lights and installed over 1,200 fluorescent luminaires. Fifty of them are four-lamp six-foot luminaires and are placed downtown. The others are two-lamp four-foot luminaires on about a 150-foot spacing. Now every street in town is lighted to code levels and Brookings is the first community in America with all-fluorescent lighting. Furthermore, they did this job with only two types of luminaires.

Faced with a shade-tree problem, the City of White Plains, N. Y., installed fluorescent luminaires at a relatively low-mounting height and provided good illumination without doing much tree-trimming. The low brightness of the fluorescent luminaire makes it particularly applicable to low-mounting heights.

Some Lighted Highways

Calumet Skyway, the final link into Chicago of a 830-mile superhighway stretching east from New York City, is a $15-million-per-mile lighted roadway. With limited shoulder space, it is imperative that lighting be provided; any disabled motorist must be easily visible to avoid rear-end collisions and to maintain the capacity of the roadway.

The Garden State Parkway in New Jersey prides itself as being the safest road of its kind. Although it has many special safety features such as headlamp glare shields, lighting plays a prominent part in keeping the road safe after dark. All entrance and exit roads in addition to the toll plazas and bridges are well lighted. This lighting is carried on to the main roadway through the full length of the acceleration lane. This same pattern is followed on the deceleration lanes for the exit roads.

It has been estimated that a driver must cope with 100 driving situations per mile of highway travel. City driving decisions jump to 300 per mile. The average motorist, it is estimated, is bound to make one wrong decision out of every 40. It is the part of wisdom to give light to motorists driving at night.

Charles M. Noble, who has served as Chief Engineer of the New Jersey Turnpike Authority, the Port of New York Authority, the Pennsylvania Turnpike, and more recently, Director of Ohio's roadbuilding program, has this to say:

"A long time ago someone invented the phrase, 'must be economically justified.' This phrase is dragged out on too many projects as a clincher to avoid providing fairly adequate design. If we had buried that phrase 20 years ago, we would not be in quite as bad a situation as we are now and more of the things done then would still be good today. Now we have a traffic volume and safety problem that must be solved. A few dollars more would have safeguarded the original investment. With highways costing millions for every mile, the nation can no longer afford to rebuild these facilities every few years."

When the George Washington Bridge, for instance, was built across the Hudson River in the very early '30's, filament lighting, typical of the era, was installed in pendant fixtures. Although we now, two decades later, consider this inadequate lighting, it served the purpose until added roadway capacity became essential.

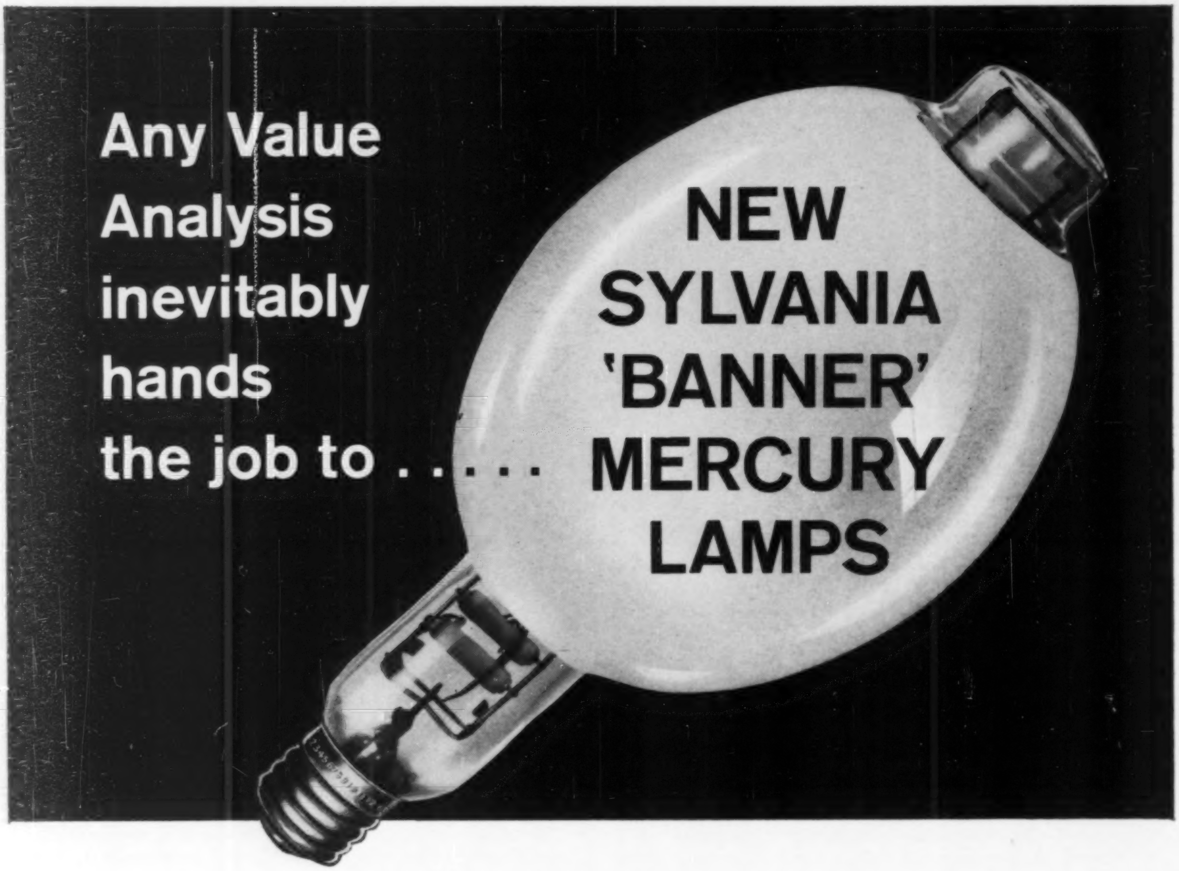
In accordance with earlier plans, the center, or dividing strip, was paved over not so many years ago, providing eight usable lanes.

What happened to the lighting? It has been modernized and improved to handle the increased traffic, just like the roadway surface. An installation of 400-watt mercury luminaires proves to be one of the best lighting jobs anywhere. The level of illumination averaging almost two footcandles will last—perhaps not a lifetime—but it is a good bet for at least another generation. A lower deck now under construction will be lighted with 250-watt mercury luminaires, suspended from the upper roadway structure.

The Golden Gate and Oakland Bay Bridges also were built in the mid-'30's, just a little later than the George Washington Bridge. A new light source—sodium vapor—had appeared on the horizon. It showed promise as an effective highway lighting tool and therefore was put to work in lighting both these bridges. When the bridges first opened for business, some doubting Thomases felt that the lighting was just a little rich. Was all that light needed?

Some claimed it was just another spectacular job of showmanship. Others felt, and rightly so, that the installations represented a big step toward higher quality lighting.

Today traffic frequently jams the bridge beyond capacity. What about the lighting? The original sodium installation is still doing yeoman service. However, after 20 years, critics say, "Isn't the lighting a little skimpy?" ◄◄


Any Value Analysis inevitably hands the job to . . . . .
NEW SYLVANIA 'BANNER' MERCURY LAMPS

because only Sylvania offers all these advantages:

1. Longer life—now extended from 9,000 to 12,000 hours (that's about 3 years of continuous service in a 2-shift plant!), thanks to new trimetallic electrodes.

2. More light—approximately 2 to 3 times the light of incandescents on the same power! You get more light output initially, higher maintained light, too.

3. Ruggedized construction. Banner lamps stand up to fiercest punishment. From hard glass shell to solidly welded, multiple-supported innards, they shake off shock, vibration, weather.

4. Life Recording Base—unusual feature saves precious time, annoying paper work by letting you scratch installation date in code right on the base of the lamp.

Certified Performance Policy for...
BANNER MERCURY LAMPS
Issued to
SYLVANIA

5. Certified Performance Policy—guarantees that: "Banner Mercury Lamps may be returned to the supplier for full exchange if they fail in less than 1000 burning hours, and thereafter (up to 5000 hours) for pro-rata exchange, in accordance with a pro-rata exchange value table set forth clearly in the policy form."

PLUS Lowest TCL (Total Cost of Lighting), which means cost of lamps plus power plus maintenance. Sylvania assures you of lower costs all the way!

Lighting Division, Sylvania Electric Products Inc., Dept. 63, 60 Boston St., Salem, Mass. In Canada: Sylvania Electric (Canada) Ltd., Montreal.

SYLVANIA

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GENERAL SYSTEM

OUTDOOR LIGHTING

Lake Geneva's Lighting

The day and night charm of Lake Geneva, Wis., was enhanced by a fluorescent street-lighting system. The modern appearance and brilliance without glare not only make driving easier and walking safer but discourage crime as well. The Line Material luminaires contain four lamps of six-foot length. They are mounted 30 feet high on Pfaff & Kendall aluminum poles. As each of the 100-watt lamps gives 5,700 lumens of light, the intensity per luminaire is 22,800 lumens. This gives an average maintained illumination of 1.73 footcandles, using staggered spacing of 50-60 foot intervals. The old uprights gave 0.13 footcandle.

City officials, citizens and resort visitors all appear well pleased with the trim daytime look and the gleam and glow at night.

Dean Van Ness
City Manager
Lake Geneva, Wis.

Heads NEMA's Street-Lighting Section

J. Stanford Smith, General Manager of the Outdoor Lighting Department, General Electric Co., Hendersonville, N. C., becomes Chairman of the Street Lighting Section of the National Electrical Manufacturers Association in place of E. B. Karns, Product Manager, Outdoor Lighting, Lighting Division, Westinghouse Electric Corporation, Cleveland, Ohio.

Other officers of the NEMA Street Lighting Section are F. A. Rudolph, President, Ripley Co., Inc., Middletown, Conn., and K. C. Dorland, Manager, Outdoor Lighting Products, the Union Metal Manufacturing Co., Canton, Ohio.

NEMA's Street Lighting Section budget is $118,700. Onee of its projects is a women's street-lighting crusade in cooperation with the General Federation of Women's Clubs and the *Reader's Digest*. Another is a scheduled "Operation Night Watch," which involves national broadcasting of night-accident statistics over the 1961 Memorial Day holiday.

Mr. Smith was formerly manager of Public and Employee Relations Communications for General Electric Co. and headed his company's well-known "Operation Upturn" program. ◄◄

J. Stanford Smith

Faithful to Mercury

Pasadena, Calif., the home of the Tournament of Roses and the birthplace of football "Bowl" games, installed its first mercury-vapor street-lighting system in 1949—120 pendant luminaires on Union Metal steel poles.

It replaced a five-light cluster and in the following two years the entire four-mile length of Colorado Boulevard was relighted.

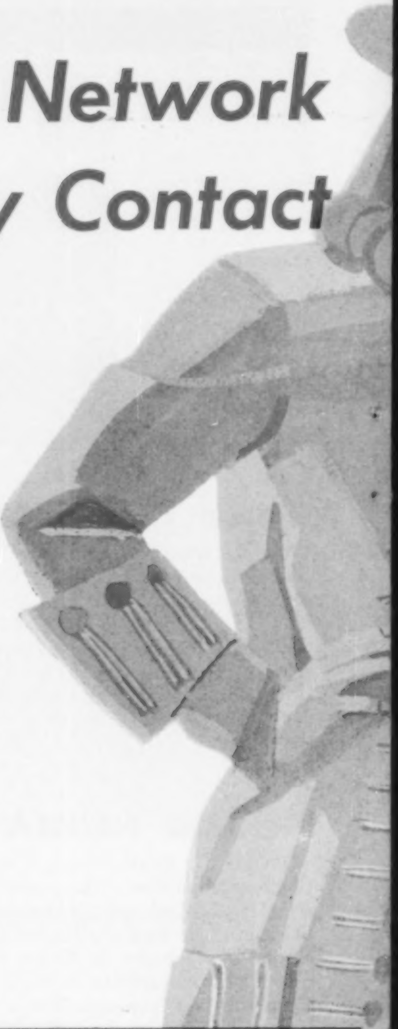
The City Council also enacted an ordinance requiring ornamental street lighting to be approved by the Engineering Department of the city's Light & Power Division. Hundreds of poles have since been installed, including many Marbelite poles produced by Pacific Union Metal Co.

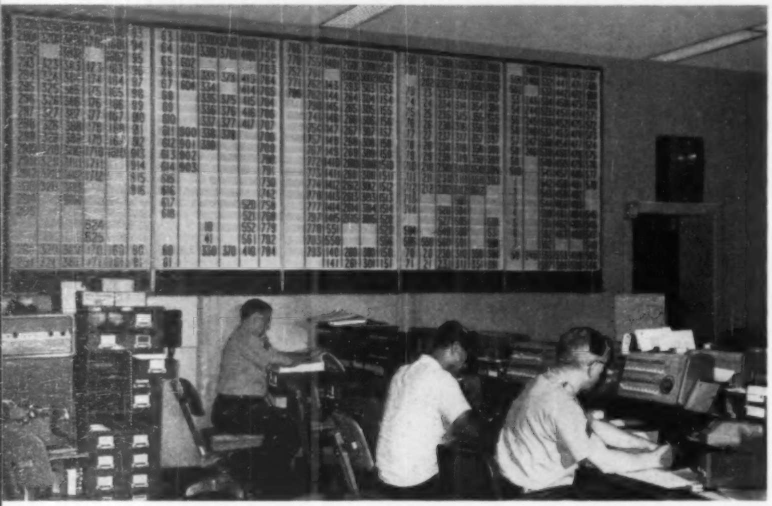
In 1956, three quarters of a million dollars were allocated for street-lighting improvements. Inadequate installations are being replaced and 2,000 single and twin-light poles mounting mercury-vapor luminaires have been installed. Most of these are 21,000-lumen units at a height of 30 feet.

The City of Pasadena expects to be one of the finest lighted cities in the United States. ◄◄

New clear voice for Billy Penn

Ultra-Modern RCA Radio Network Gives Instant 2-Way Contact

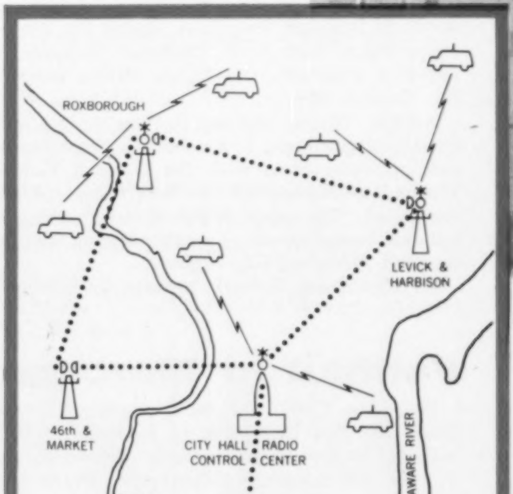


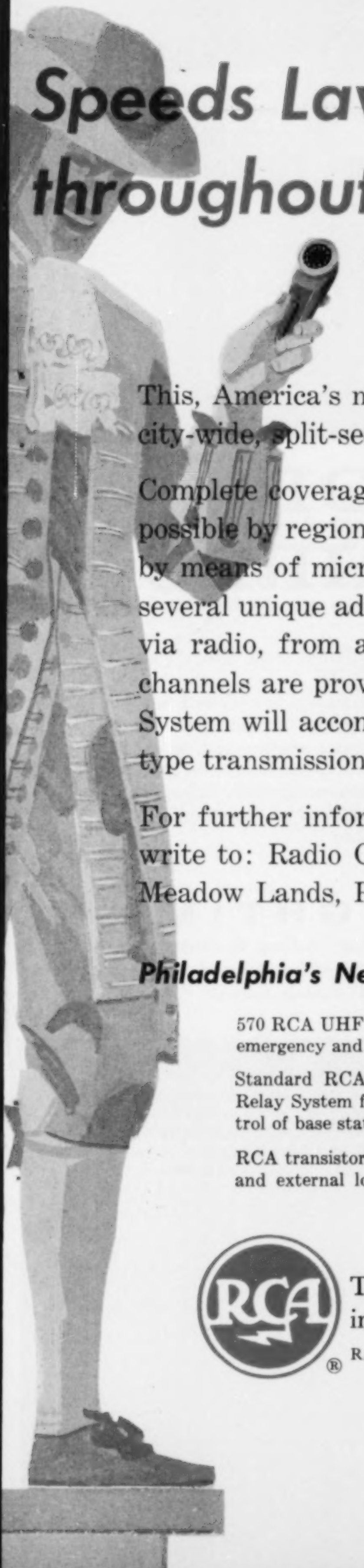


Located high in the tower of Philadelphia's City Hall is this Master Control Room. Unique car-in-use display board (in background) automatically indicates police cars in service.

Microwave dish antennas at the feet of Philadelphia's famous Billy Penn relay messages from the tower dispatch room to the network of base stations.

With this ultra high frequency RCA equipment the officer is in instant two-way communication with headquarters.


ROXBOROUGH
LEVICK & HARBISON
46th & MARKET
CITY HALL RADIO CONTROL CENTER
DELAWARE RIVER
24th & WOLF
MICROWAVE LINKS
VHF STATIONS (FOUR BASE STATIONS AT EACH LOCATION)



Speeds Law Enforcement… throughout Philadelphia's 130 Square-Mile Area

This, America's most modern police communications system, provides city-wide, split-second control of Philadelphia's patrol fleet.

Complete coverage of even the most distant part of the city is made possible by regional radio networks, remotely controlled from City Hall by means of microwave relays. This method of communication offers several unique advantages: The entire city can be effectively covered, via radio, from any one of the four transmitter locations. Separate channels are provided for police, detective and emergency operations. System will accommodate telephone, facsimile, telemetering and teletype transmissions.

For further information about RCA 2-Way Radio for municipal use, write to: Radio Corporation of America, Telecommunication Center, Meadow Lands, Pa. Or mail coupon below.

Philadelphia's Network Comprises:

570 RCA UHF 2-way radios in police patrol, emergency and other vehicles.

Standard RCA CW-20A Microwave Radio Relay System for remote operation and control of base stations.

RCA transistorized public address amplifiers and external loudspeakers for 250 vehicles.

Multiplex equipment for simultaneous operation of four base station transmitters in each area.

Special alarm circuits operated by microwave.

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Meadow Lands, Pa.

☐ Please send me FREE literature on the new RCA Transistorized "LD" Mobile Radio.

☐ Have RCA Communications Specialist contact me and explain why this is today's best value in 2-way radio.

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UNITIZED URBANOVAL
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REVERE
URBANOVAL
No. 2501-B250

New Revere 2500 Series Urbanoval luminaires use 100, 175 or 250-watt mercury lamps. Unitized Urbanoval features built-in constant-wattage or reactor ballasts. Conventional Urbanoval is designed for external ballasting. Both types are available with or without mounting adapter for E.E.I.-NEMA standard plug-in locking-type photo-electric control. Choice of Revere-Corning Pyrex® molded prismatic refractors provides I.E.S. Type II or Type II—4-way distribution (or Type III or 4-way with phosphor-coated lamps). Available with 1¼″ or 2″ slipfitter.

NEW FAMILY OF REVERE LUMINAIRES

New *unitized* oval mercury luminaires with built-in ballast components are the latest addition to the Revere family of street lighting equipment. New 2600 Series Endoval luminaires provide high-level, glare-free illumination for arterial streets and highways. New 2500 Series Urbanoval luminaires are designed to provide economical lighting for residential areas or secondary streets where uniform, low-level lighting is desired. Both series offer the advantages of modern styling, substantially reduced installation costs, and efficient, economical performance.

Revere's new unitized luminaires together with newly designed conventional luminaires let you solve every street and highway application problem the one *best* way. You can select high quality, design-matched Revere luminaires, poles and equipment specially engineered for every street lighting need. *Send for complete catalog information and technical data.*

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In Canada: Curtis Lighting, Ltd., Leaside, Toronto, Ontario

New Revere 2600 Series Endoval luminaires use 250 or 400-watt mercury lamps. Unitized Endoval features built-in constant-wattage or reactor ballasts. Conventional Endoval employs same housing, reflector and Revere-Corning Pyrex® molded prismatic refractor, but without built-in ballast components. Both types are available with or without mounting adapter for E.E.I.-NEMA standard plug-in locking-type photo-electric control. Adjustable socket positions produce A.S.A.-I.E.S. Types II, III, or IV with proper choice of lamp.

REVERE
UNITIZED ENDOVAL
No. 2633-B400

Creative Lighting Of Miami Beach Mall

By **D. LEE POWELL**
Mayor

Miami Beach, Fla., has a mall stretching eight city blocks (about 4,000 feet) along Lincoln Road. Cut off from vehicular traffic, landscaped and relighted, it is said that the two rows of stores bordering on either side of the mall form one of the most attractive downtown shopping districts in the country.

The architect for the mall was Morris Lapidus, Kornblath, Harle & Liebman, and the lighting was by Abe H. Feder, 15 West 38th St., New York.

There are benches throughout the area and no sooner were they placed than they were occupied—long before the mall was completed. The idea is that every city needs places that are not for entertainment or sports but places where people don't have to do anything except be. Such places are particularly needed at night, when most people are free.

The lighting of this area had to underscore the architectural design without intruding on it. For example, the parade of street lights was removed, because street lighting is too uneven, starts too low, and requires too many poles. Instead, the general lighting was designed as a blanket of light. For instance, current street lighting liberally utilizes fluorescent lamps which cannot project light very far; most of the light is lost in space and the light that remains tends to hover around the lamp itself, some 30 to 35 feet above ground. At the Lincoln Road Mall, the volume of space between the lamp and the ground is solidly filled with light.

The blanket of light should be up as high as possible, so that people can see light everywhere. Florida, however, is within the hurricane belt, and the pole height had to be kept to 60 feet. Even at this height, only eleven tapered galvanized steel poles are used, 250 feet apart, down the middle of the mall. With taller poles fewer poles would have been necessary.

Three of the poles have six luminaires each and the eight others have four each. The luminaire consists of a 1,000-watt mercury vapor bulb in a specular alzak aluminum reflector housing, designed by Feder. This lamp, made by the Radiant Lamp Corp., 298 Jelliff Ave., Newark, N. J., produces 53,500 initial lumens. It is designed as much for dramatic impact as for area lighting. The plantings are palms from all over the tropics; the tall "Weeping Podocarpus" evergreen from South Africa; shrubbery from Polynesia, Ceylon, Malaya, Mexico and Abyssinia.

A view of the Miami Beach mall showing the flagpoles, shelters and the tall lights.

It is an interesting point that the total power required for this intensely bright general lighting of the eight-block expanse is considerably less than the power that had been required by the previous street lighting consisting of many more poles and luminaires.

Night lighting of the outdoors is moving slowly towards the ideal of a daytime feeling. Slowly the light sources are mounted further from the ground. From the norm of 20 to 28 feet high, today light poles are more and more frequently 35 to 45 feet high. The limitations of the light sources themselves have prevented still greater heights. Few lamps could project onto the ground enough of the light they were actually producing from any height greater than 20-28 feet but Radiant has come up with the answer. The company has developed a special 1,000-watt mercury lamp, in an R80 envelope, with its own internal reflector. Now the reverse is true: a powerful and efficient light source is available, called the Merco-Spot. The mercury-vapor lamp, with a rated life of 6,000 hours, can project light onto a target at a distance over 600 feet.

Architectural Poles

But the designing of light poles that can stand up under all weather conditions keeps the mounting heights lower than they should be. Our thinking may have to extend beyond narrow tapered poles to include actual architectural forms on which light sources would be mounted. These architectural forms could be as high as skyscrapers if necessary and become a positive element of design, integrated into a given landscape. Fewer and fewer of these forms would be required proportionate to their height.

There are nine different water forms in this eight-block mall. Two of these are jet fountains; one is a pond; two are mushroom fountains. All are lighted with PAR-64 incandescent underwater fixtures made

(Continued on page 137)

HANDLE WITH CARE

That's the treatment your water well gets when you call Halliburton for Acidizing Services.

CARE in helping you select the proper type and strength of acid.

CARE in placing the acid solution at the proper rate and pressure.

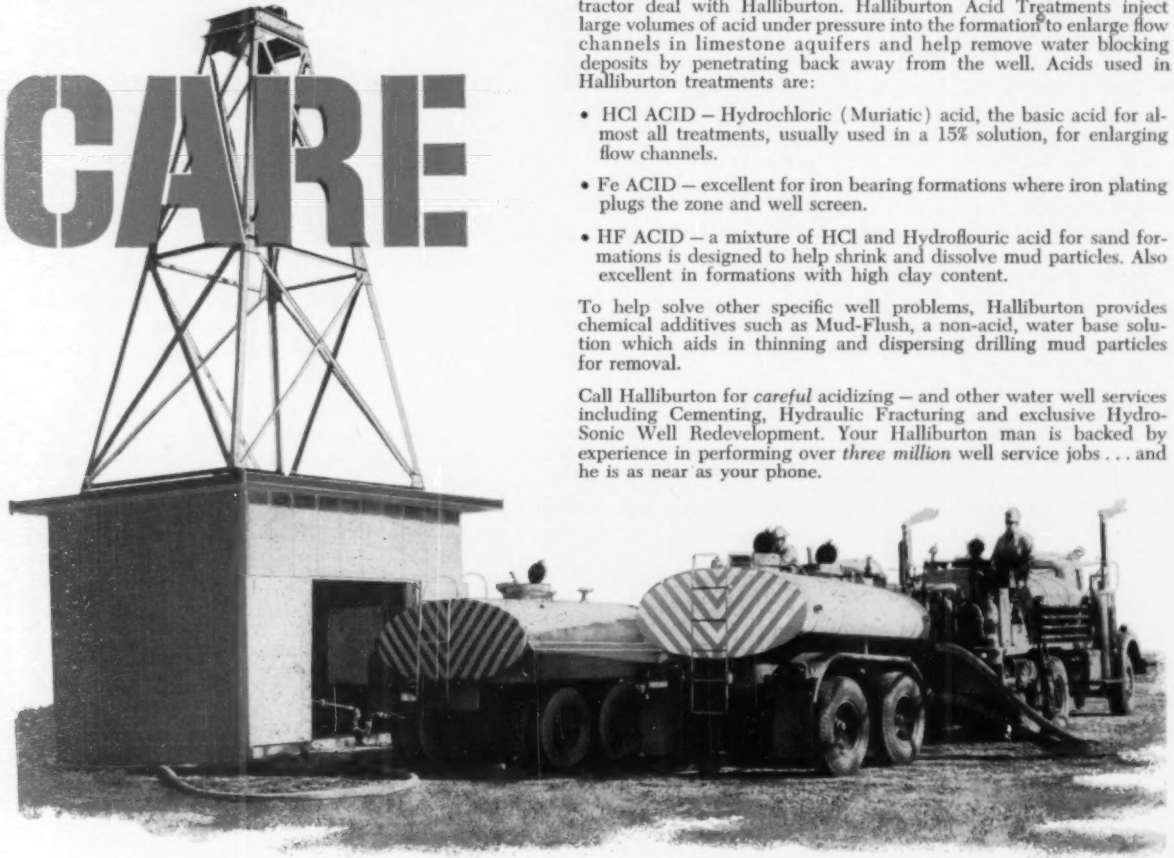
CARE in performing a truly professional well treatment all around — *and at a reasonable price!*

This care and attention is part of the service when you or your contractor deal with Halliburton. Halliburton Acid Treatments inject large volumes of acid under pressure into the formation to enlarge flow channels in limestone aquifers and help remove water blocking deposits by penetrating back away from the well. Acids used in Halliburton treatments are:

- HCl ACID – Hydrochloric (Muriatic) acid, the basic acid for almost all treatments, usually used in a 15% solution, for enlarging flow channels.
- Fe ACID – excellent for iron bearing formations where iron plating plugs the zone and well screen.
- HF ACID – a mixture of HCl and Hydroflouric acid for sand formations is designed to help shrink and dissolve mud particles. Also excellent in formations with high clay content.

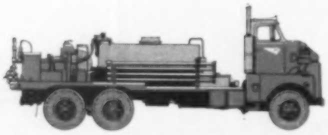
To help solve other specific well problems, Halliburton provides chemical additives such as Mud-Flush, a non-acid, water base solution which aids in thinning and dispersing drilling mud particles for removal.

Call Halliburton for *careful* acidizing — and other water well services including Cementing, Hydraulic Fracturing and exclusive Hydro-Sonic Well Redevelopment. Your Halliburton man is backed by experience in performing over *three million* well service jobs . . . and he is as near as your phone.



Dedicated through research and performance to better service for America's water wells

WATER WELL SERVICES



All Halliburton Services are performed under a contract containing a limited liability provision.

Halliburton
COMPANY • DUNCAN, OKLAHOMA

(Continued from page 135)

by the Simes Co., College Point, N. Y., except the pond, which is lighted by a R3R10 combination incandescent underwater fixture made by the Kim Lighting & Mfg. Co., El Monte, Calif. They have special horizontal and vertical adjustments for targetting purposes and they are designed for easy relamping.

Color

Something new has been done here in the way of color. The lighting designer was the first to use cinemoid color filters underwater but at the Lincoln Road Mall, Plexiglas made by Rohm & Haas Co., is being used. Comparatively cheap, it lasts six times as long as the cinemoid.

Three tints of color are used: blue, blue-green and orange. Sixty-five underwater units are used. The PAR-64 units have provision for color filters. The colors used will vary with the type of exhibit being shown.

There are nine low, concrete forms, known as shelters. Six of these shelters have fluorescent lighting. The problem here was that the interiors are completely open and are cut off from the exterior by roofs only. Since the shelters are to be used for display and exhibit purposes, warm white deluxe fluorescent lighting would have been the automatic choice because of its minimum color distortion. What was actually chosen was the new Sylvania color, "natural."

This natural fluorescent color is cool to the eye, blending well with the exterior lighting, but in reality has considerable red in it, which improves the color rendition of complexions as well as objects.

At either end of the mall are 13 flag poles, each lighted by a grade-mounted, 300-watt unit.

A standard grade-mounted mercury-vapor unit is spotted throughout the mall for undertree lighting. Mercury-vapor sources are ideal for tree lighting. The blue-green feeling of foliage at night is emphasized. Incandescent lighting turns leaves into a muddy brown.

The Lincoln Road Mall is a place for people. The night it opened, 85,000 people came to look and walk. The cost stayed within the original $600,000 bond issue. ◄◄

Mark-Rite Model 9000 LINEMASTER automotive type clutch and differential with chain drive deliver maximum power with no slippage and will climb grades up to 20%.

★ **MODEL 9000**
Self-propelled

Mark-Rite

LINE MARKER

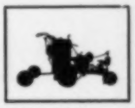
Pays Its Own Way

Users of the Mark-Rite Model 9,000 one man operated Line Marker report that it lays 25% to 50% more line per day than other machines.

This machine was designed for use in cities, airports, counties and for other heavy duty uses. Precision built throughout. Stripes 1, 2 or 3 lines solid or skip simultaneously. One or two colors. Paint capacity 10 to 60 gals. Automotive precision steering and "Hairline" spray control issues clean straight or curved lines, in widths from 2" to 6". It can turn on a 6 foot radius. Accessories permit many other uses for this versatile machine, such as spray painting, insect and weed control spraying. Write today for literature or demonstration.

MODEL 301

MODEL 401



MODEL 8088

MODEL 80880

★ MODEL 9000

FOR COMPLETE SPECIFICATIONS WRITE FOR THIS 16-PAGE CATALOG TODAY . . . Tells how to select the proper Line Marker for your Job.

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New Permanence!
New Freedom from Maintenance!

Here's the proven protection of chain link…in long-life aluminum. Defies corrosion! Never needs painting! New high-strength alloy stands solid and handsome through the years.

Aluminum Chain Link is specified for more and more plants, highways, parks and playgrounds…because it saves so much on painting and maintenance.

Call your Anchor Man for more information. Write for free catalog: Anchor Fence, Dept. AC3, 6661 Eastern Ave., Baltimore 24, Md.

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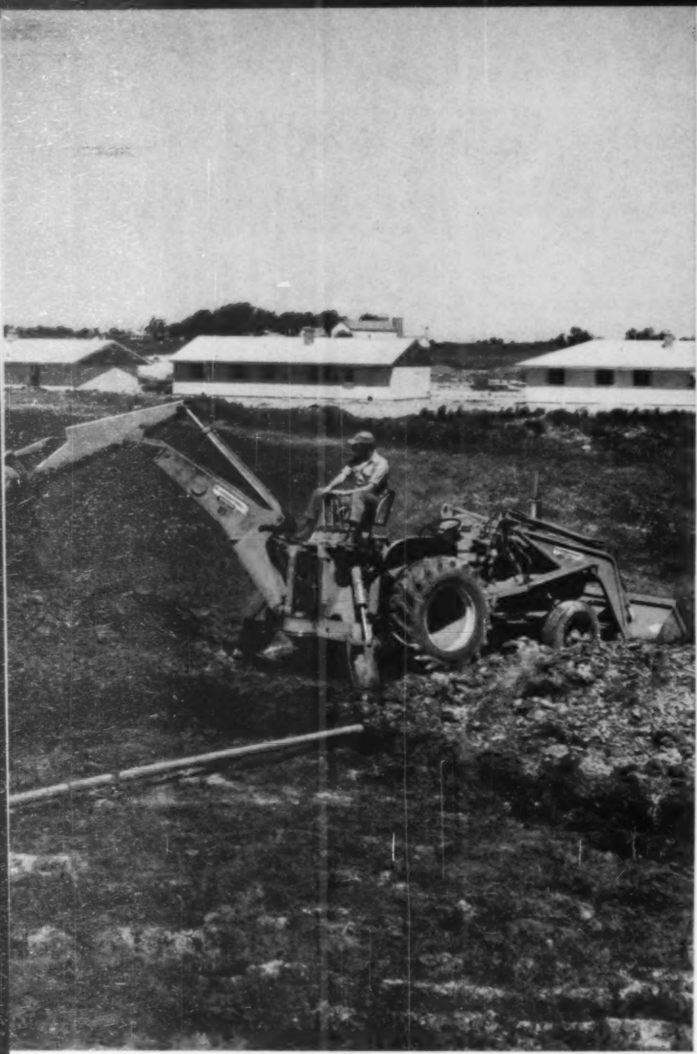
made of
REYNOLDS ALUMINUM

Watch Reynolds TV shows: "HARRIGAN AND SON" Friday evenings, "ALL STAR GOLF" Saturdays ABC-TV.



Dig up to 800 feet of trench an hour—6 to 12 inches wide, as deep as 6 feet—with International 340 and ladder-type trencher.

For toughest digging, as deep as 13¼ feet, team the International 460 with heavy-duty No. 95 backhoe.

For general purpose trenching to 10-foot depth the International 340 tractor and No. 65 backhoe offer outstanding value.

Fast, clean, low-cost trenching!

with International tractor stamina and economy

High capacity and on-the-job dependability are the true measures of low-cost digging and trenching. You get them *both* in the highest degree with International® 340 and 460 Industrial tractors. These rugged Internationals have the built-in strength and balance to let the operator crowd the backhoe bucket for full loads . . . even in the toughest kind of digging . . . and the *stamina* to stand up in heavy-duty service long after more lightly built units have "had it."

Keep costs down—match tractor size to your range of jobs. The husky International 340 is a four-cylinder tractor—gasoline or Diesel—for 10 or 12½-foot backhoes and 1,600-pound loader capacity. The mighty International 460 is powered by six-cylinder, Multi-Range gasoline or Diesel engine. It has the power and weight balance for 12½ or 13¼-foot backhoes—lifts up to 2,500 pounds with front end loader.

The IH Dealer near you will be glad to give you full information—demonstrate if you wish. See for yourself the quality of construction . . . the convenience of operation . . . that put International 340 and 460 tractors in a class by themselves for high-production digging and trenching.

PARTS and SERVICE EVERYWHERE

5,000 dealers backed by 12 parts depots

INTERNATIONAL HARVESTER

The City Tells Its Story

Edited by **PAN DODD EIMON**

Municipal
Public
Relations

California cities report on public relations

Citizen-Centered Projects Produce New Understanding

To meet the spectacular and trying problems of growth, California city administrators have discovered how effective municipal public relations activities can be used as a tool of the citizen-oriented city government.

San Jose "charted its future" in a city-citizen seminar which attracted a room-filling 500 persons. Covina surveyed its 19,000 citizens to discover what they like about the city, what they want changed. Glendale has explained city operations in a handsome 16-mm film which was produced for under $2,500. Lakewood finds its "news-in-a-nutshell" bi-monthly letter a good reporting technique.

The City of Beverly Hills took key local citizens on a bus tour to let them see what the city had done and was planning. Downey puts citizens to work in 17 committees, one of which has reached a friendly hand across the Mexican border to a sister city.

San Jose Seminar

In San Jose (population 127,600) the city government teamed up with the League of Women Voters and the Political Science Department of San Jose State College for a Charter Year Seminar, one of several affairs which marked the 110th anniversary of the city. Its purpose: "to define problems faced by the City of San Jose in this period of fabulous expansion; to meet with interested citizens and experts to examine the problems and propose solutions to them; to improve methods by which the city has handled these problems in the past; to inspire and stimulate interest and leadership among both lay and professional leaders in the community in San Jose city government; to evaluate the philosophy and direction of our city government; to discover and define new trends, new ideas in city government in the interest of the citizens and taxpayers."

The seminar was called "San Jose Charts Its Future." Five hundred persons paid $10 each to participate in the all-day affair (8:30 a.m. through the dinner hour). Panel discussions covered: annexation; intergovernmental cooperation; planning, zoning, and greenbelts; finances and economics; transportation; people and the population explosion; public health and safety. The seminar, one of many public relations activities of San Jose, "has resulted in better citizen understanding of our government and its problems," says San Jose City Manager A. P. Hamann.

City Manager C. E. Perkins of Glendale and Robert Christofferson of his staff check the city's 20-minute movie.

Covina Citizen Survey

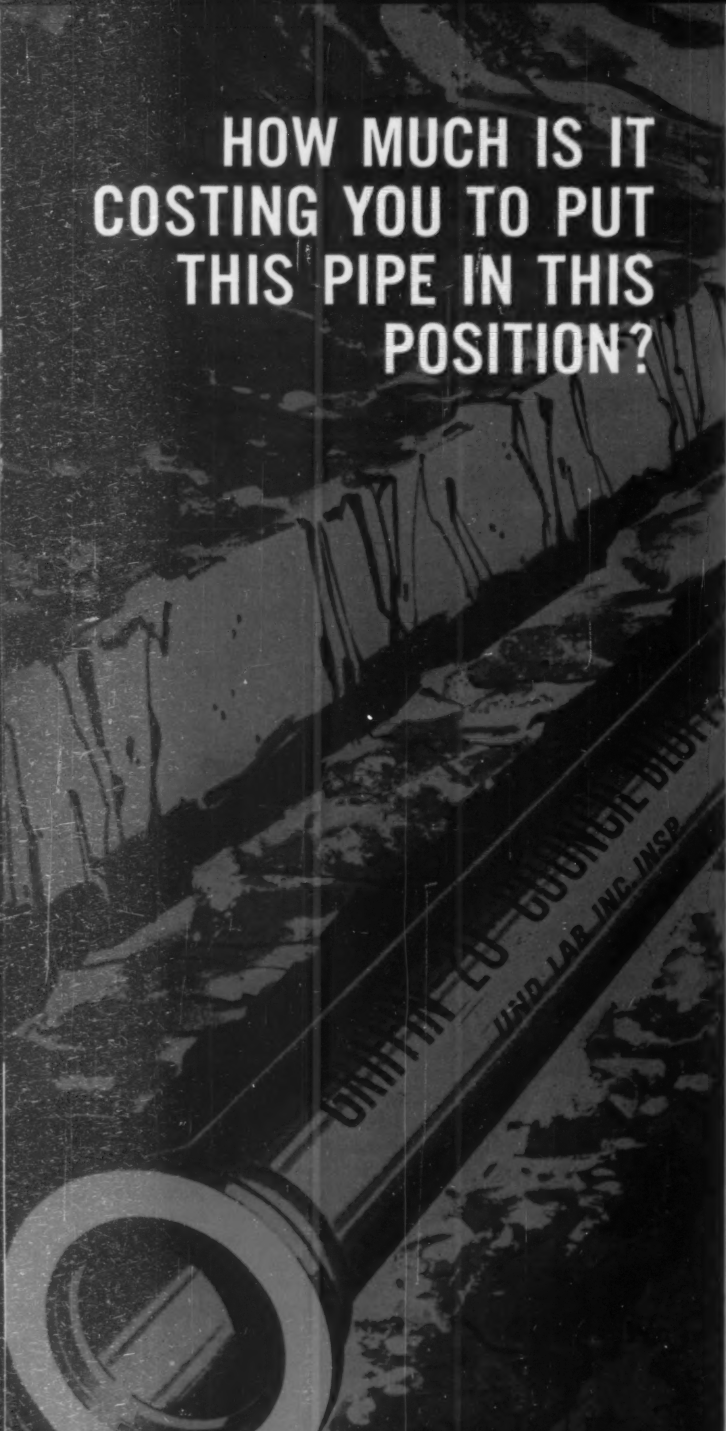
Covina (population 19,000) wanted to improve communications between the general public and the local government. So the city developed a two-page (front and reverse of regular city hall stationery) questionnaire that would allow people to: evaluate the importance and character of municipal services; make suggestions for the improvement of these services; and comment on the most and least desirable features of living in the city, the taxes, and how the community should develop.

The questionnaire, in its specially-designed envelope, was mailed to every home and business house. Citizens could return the questionnaires by folding the form to a pre-printed return address. Of 5,400 sent out, 18% were returned. Survey cost, including postage, was under $400. Results were reproduced for all interested citizens, were carried as a full-page feature in the local newspaper, and were used as one basis for the next year's budget.

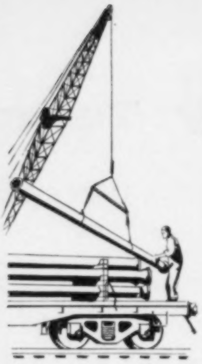
Glendale's City Movie

Glendale (population 115,000) has become used to lettters like this from some of the 5,500 persons who have seen its film, "Decade of Progress," in more than 160 showings. "On behalf of the Crescenta Valley Reading Circle, I wish to tell you how much we all enjoyed the pictures . . . " or "For our cub pack, I want to thank the City of Glendale for the presen-

(Continued on page 141)



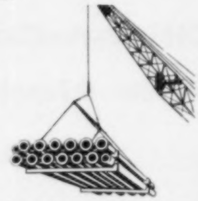
HOW MUCH IS IT COSTING YOU TO PUT THIS PIPE IN THIS POSITION?



DO YOU UNLOAD PIPE 1, 2, OR 3 AT A TIME?

If you do you'll find unloading *flat cars* easier, more economical than unloading from a gondola. Perhaps you already have the crane capacity to save even more man hours by using standard pallets especially designed for *Griffin-20** pipe. With a fork-lift, or a crane, you can unload 96 pipes in *four* or *eight* lifts. (One flat car of 6″ pipe, or four double-pallets.) Or, if your crane is in use elsewhere, "skid" pipe directly to your truck or to your stockpile.

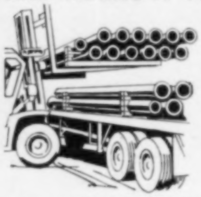
DO YOU STOCKPILE?



Our single-layer and double-layer pallets are specifically designed for multiple handling. Pipe remains palletized, ready for re-loading. Which pallet can your lift handle?

Single-Layer Pallets			Double-Layer Pallets		
Size	**Pieces**	**Weight**	**Size**	**Pieces**	**Weight**
4″	16	2½ tons	4″	32	5 tons
6″	12	3¼ tons	6″	24	6½ tons
8″	9	3¾ tons	8″	18	7¼ tons
10″	7	3¼ tons	10″	14	6½ tons
12″	6	3⅞ tons	12″	12	7¾ tons

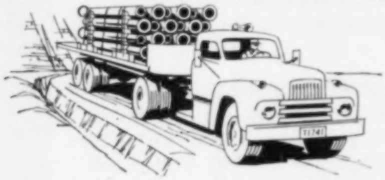
IF YOU STOCKPILE YOUR PIPE, WHAT IS YOUR COST FOR RE-LOADING IT AND TAKING IT TO YOUR JOB-SITE?



Pallets are designed for *quick* re-loading on trucks or flat-beds for installation-site delivery. You reap the benefits of a double saving in man-hours, since you save as much in re-loading as you do in unloading!

CAN YOU USE PIPE TRUCK-DELIVERED TO YOUR JOB-SITE?

All trucks for *Griffin-20* pipe are equipped with ropes and skids for easy trench-side placement of individual pipes. Use of an overhead crane is not necessary.



Remember...Ultimate cost is not what you pay for pipe, but how much it costs you to deposit it alongside trench.

*Griffin-20 trademark is the property of Griffin Wheel Company.

GRIFFIN PIPE DIVISION

GRIFFIN WHEEL COMPANY . . . COUNCIL BLUFFS, IOWA

CHICAGO AREA POrter 6-0452 • 850 East Green Street,
Bensenville, Illinois Marvin E. Simpson, District Manager
Alex E. Kessler (East Troy, Wis.) Sales Representative

COUNCIL BLUFFS 322-6641 • 2601 Ninth Avenue
John L. Larson, Sales Representative

DENVER West 5-2427 • 1400 W. Evans Avenue
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William R. Colton, District Manager
Willard F. Klimmek, Sales Representative

KANSAS CITY, KANSAS DRexel 1-5690 • 1134 S. 12th Street • Thomas M. McGinley, Sales Representative

(Continued from page 139)

tation of the film . . . the boys enjoyed it fully, and I think it was a wonderful opportunity for public relations with the parents . . . "

The purpose of the film, according to City Manager C. E. Perkins, was "to inform the citizens of Glendale concerning progress made in the community during the postwar decade." In addition to reporting, "we also had as objectives: instilling additional pride in the community and laying the foundation for future programs and progress."

Glendale decided to make the film after a filmstrip—used in prior years—met with excellent response. A university student in theater arts served as director of the project. He and the city manager's staff researched, wrote, photographed, edited, and produced the 20-minute movie. Services contracted for included: professional narration, music dubbing, sound effects, titling, and other technical processes. First cost estimates ranged from $5,000 to $40,000. The city managed to hold the final cost, including three prints, to under $2,235.

Of particular interest is the 8½-by-11-inch, three-fold brochure which is distributed to persons who view the film. It contains financial information which City Manager Perkins hopes citizens will "look over thoroughly after seeing the movie."

Lakewood's Newsletter

Lakewood's 72,000 people are reached bi-monthly with a miniature-size low-cost newsletter which reports city operations, plans for the future, and financial data. The newsletter is multi-lithed, costs a fraction over a nickel a copy. Nineteen thousand issues go out from City Hall every other month. The cost is $300 for printing, $113 for addressing, $572 for mailing and miscellaneous.

Beverly Hills Bus Tour

Beverly Hills (population 35,000) devoted much time and effort to its bus tour for citizen leaders and found that the time and effort couldn't have been better spent. The tour was an all-day affair (9:30 a.m. to 3 p.m.) starting and ending at City Hall. Citizens inspected new facilities at a fire station, develop-

(Continued on page 143)

PROTECT YOUR BUSINESS SECRETS!

AUTO-SHRED *Destroys*
CONFIDENTIAL LETTERS, OBSOLETE RECORDS, PLANS, DRAWINGS, ENGINEERING, EXPERIMENTAL DATA
IN SECONDS

Designed for your office, this new, lightweight compact AUTO-SHRED will convert all your confidential, obsolete business papers into ¼" shreds quickly and efficiently. Quiet. Easy to use. Automatic hopper takes up to 100 sheets of paper at a time. Will slice through paper clips, pins and staples. Completely enclosed (positively safe) in a beautifully designed fiberglass case that matches the practical appearance of other office equipment. Don't let your business secrets find their way into unauthorized hands.

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FOR BOATING'S
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Here's the power you want for the really tough jobs of commercial boating—Evinrude's 1961 Big Twin. Develops 40 hp at 4500 rpm. New, **foolproof** fixed-jet carburetion. Thermostat controlled engine for most efficient performance under all conditions. Fast-stepping, fuel-saving Cruis-Throttle. Amazingly easy manual starting. Choice of props to fit boat and work. Quieter-than-ever operation. Hard-working, smooth-running, load-lugging, long-lasting, sea-going power—at a price that makes it boating's standout value. If you're a boatman whose living depends on dependable power, the 1961 Big Twin is for you. See your Evinrude dealer—listed in the Yellow Pages under "Outboard Motors."

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A Division of Outboard Marine Corporation
In Canada: Mfd. by Evinrude Motors, Peterborough

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FIRST IN OUTBOARDS

AREA AND FLOODLIGHTING
the MODERN way

TULITO
TAPERED STEEL LIGHTING TUBES

For
- Baseball Diamonds
- Football Fields
- Playgrounds
- Shopping Centers
- Truck Terminals
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- Race Tracks
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Engineered for Permanence, Strength and Safety . . .
Designed to accommodate from 2 to 40 lights.
Streamlined to enhance the appearance of any lighted area.

Write for colorful illustrated brochure
MEYER MACHINE, INC.
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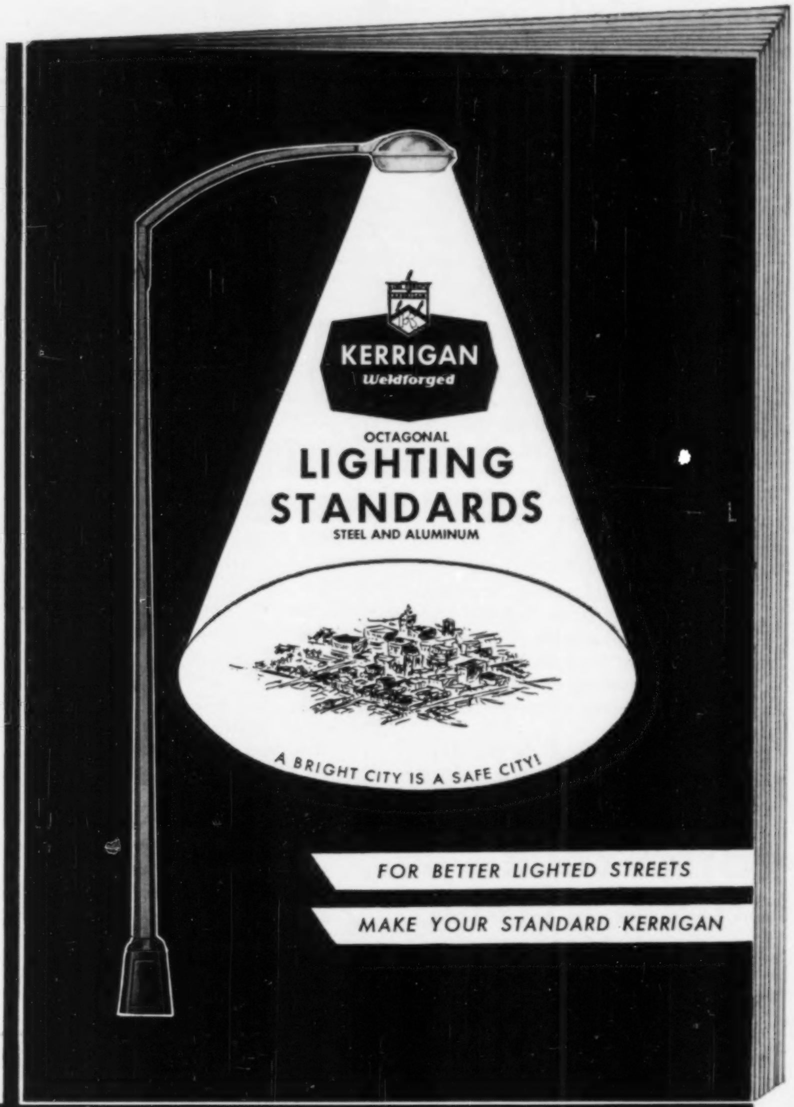
NEW CATALOG

LIGHTING STANDARDS

Styled and Engineered for Today's Modern Luminaires



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OCTAGONAL
LIGHTING
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STEEL AND ALUMINUM

A BRIGHT CITY IS A SAFE CITY!

FOR BETTER LIGHTED STREETS

MAKE YOUR STANDARD KERRIGAN

New, 44-page catalog illustrates and describes, with full engineering data, Kerrigan's line of trim tapered octagon lighting standards in steel and aluminum. Get YOUR copy NOW and select the shaft of your choice from a number of streamlined, high-strength standards that will add new beauty and grace to the most modern street, highway, bridge or area lighting project.

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KERRIGAN IRON WORKS COMPANY
NASHVILLE, TENNESSEE
SUBSIDIARY OF
ROCKWELL-STANDARD
CORPORATION

STREET AND AREA LIGHTING STANDARDS IN STEEL AND ALUMINUM

(Continued from page 141)

ment projects underway, the city's new recreation center where luncheon was served, and local park facilities. Two buses were provided free by a local company. Fifty persons were invited for the tour. The tour guides were Administrative Officer John B. Wentz and his assistant, Harvey Hurlburt.

Following the luncheon, the mayor and each councilman spoke briefly and the administrative officer previewed the budget. Mimeographed programs—with a large map of Beverly Hills showing development sites and facilities visited—were provided each guest. Participants were unanimous in their acclaim of the bus tour-and-briefing.

Friendly Handshake

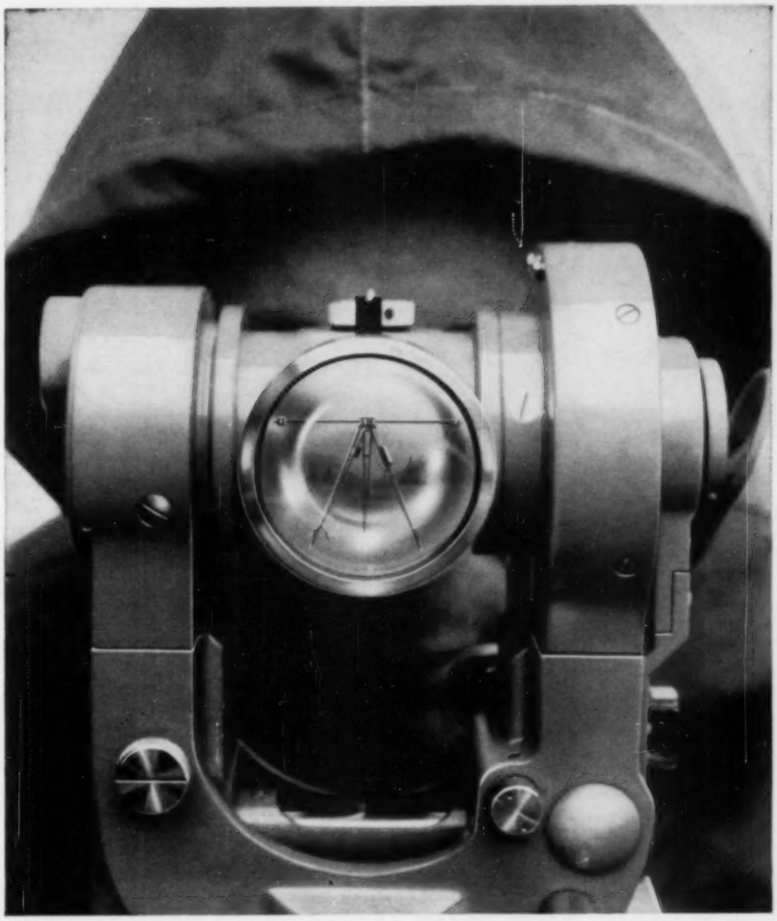
Downey (population 90,000) was incorporated in 1956 and has developed under the guiding hand of interested citizens. More than 200 of them serve on 17 continuing boards and commissions, according to City Manager Oren L. King. Committees are chosen by the city council. The citizen discussions, in these group meetings, "bring a wide range of experience to bear on diverse municipal problems," King reports.

With the impetus given it by an active 18-member citizen committee, Downey became the first U. S. city to choose a Mexican city as its "twin" under the President's "people-to-people" program. There has been an exchange of official representatives between the two cities and, last October, Downey saluted Guadalajara with a four-page brochure picturing eight landmarks in each city and a brief historical sketch of each. It was widely distributed in Downey and in Guadalajara. ◄◄

Minit Garage For Trenton

The City of Trenton, N. J., has granted to Harold P. Hallock, president of Minit Park Garage, New York, a zoning variance for a 172-car garage on land leased from the Stacy-Trent Hotel. The garage will have direct entrances into it and the adjoining Hildebrecht Hotel.

Although the City of Trenton has a Parking Authority, Mayor A. J. Holland commented favorably on private enterprise supplying this much needed facility. The hotels will offer free, in-hotel, overnight parking for their guests to meet the competition of outlying motels in the belief that motorists would be happier in the city. ◄◄



THE UNIVERSAL STANDARD for accuracy, ruggedness and speed of operation. With readings direct to one second, the instrument is ideal for triangulation and laboratory use. AVAILABLE WITH A COMPLETE RANGE OF ACCESSORIES... Invar Subtense Bar, Diagonal Eyepiece Set, Pentagonal Objective Prism, and Autocollimation Eyepiece.

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One of a *complete* line of superb instruments for Surveying, Photogrammetry and Microscopy. *Write for Booklet T-2.*

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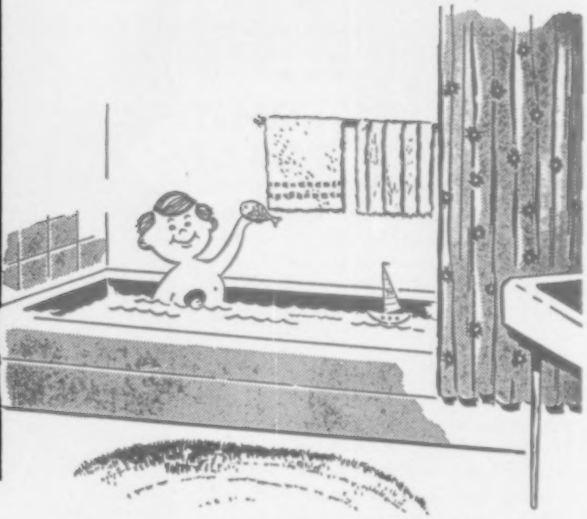
RECOMMENDED FOR DEEP WELL SUBMERSIBLE PUMP INSTALLATIONS...

RIGID PIPE

made of ***ABS Plastic***



RIGID PIPE SUBMERSIBLE PUMP INSTALLATIONS OFFER NEW PROOF OF SUPERIORITY OVER CONVENTIONAL PIPE

BE *ABSolutely* SURE . . .
INSIST ON RIGID *ABS* PIPE
made of
CYCOLAC
THE BORG-WARNER PLASTIC THAT IS
TOUGH, HARD AND CORROSION-RESISTANT

Write Dept. A-3 for the name of your nearest supplier

In municipal installations . . . in irrigation lines . . . in sprinkling systems . . . and now in submersible jet pump installations, rigid pipe made of Cycolac ABS is demonstrating its ability to out-perform conventional pipe! Highly tensile and rustproof, it is recommended by submersible pump manufacturers for 100-ft. and deeper wells. Tasteless, odorless and non-toxic, it is fully NSF-approved for carrying drinking water. Swiftly installed and connected, it is acclaimed by submersible pump installers everywhere—saves 50 to 75 per cent over metal pipe installation costs! An added feature—servicing a unit suspended from lightweight rigid pipe is relatively simple!

MARBON CHEMICAL
B-W
BORG-WARNER

MARBON CHEMICAL DIVISION **BORG-WARNER**
WASHINGTON WEST VIRGINIA

Here's Some Help in Buying Uniforms

By **DAVID E. SINGER***

Every man wears a suit. With a policeman or fireman, it's usually a uniform. Somebody has to order it.

"It," says a police chief, "is the blindest article I have to buy."

The simplest procedure, of course, is to tell the men that this year's color is blue, go to Max and order a uniform.

But possibly half the cities specify the uniform fabric and many actually buy and stock the season's supply.

Having this specification, and Max, the men can do no wrong. But the chief or the city purchasing agent can.

Since World War II ended, there have been many changes in the textile scene. For instance, for many years the standards for fine police and fire uniform cloth were set by Thomas Oakes & Co. It was widely recognized that the indigo wool dyed products of this Bloomfield, New Jersey, plant were the best and the problems of price were confined to the tailoring level. It was simply a question of a choice of uniform maker to produce the uniforms of Oakes cloth. This quality fabric was so deeply entrenched in police equipment that today, 13 years after the mill closed, it is still requested and its unavailability is still lamented by those wanting it.

The war brought both shortages and the disappearance of indigo dye. Police chiefs did the best they could during the emergency. The natural result was a breaking down in specifications.

In 1947, Thomas Oakes closed the mill and withdrew the name and trademarks from the industry. Then the door opened to the scramble for police and fire department business. It still continues. Other mills, which also produced fine fabrics in other fields, have also liquidated but their names and trade marks continue to flourish under quite different circumstances. Of all the uniform fabric mills in business in 1942, only two worsted mills and two wollen mills exist in their original forms. Several new ones have come into the field during the past eight or ten years.

Today's Uniform Fabrics

The Oakes company had no monopoly on "know how." There are no secrets in the textile industry. Nor did they have sole access to the indigo dye for which they were famous. It is available to any mill. Very few want it because indigo has an affinity for everything it touches, and is a messy process for the dyehouse. The sales organizations selling to police departments, are glad to keep indigo out of the uniform field because it does add a few cents to the fabric cost. The result is that a mill conscientiously trying to serve

(Continued on page 147)

---

* Mr. Singer is in charge of sales for the Franklin Worsted Co. and is an authority on fabrics for police and firemen's uniforms.

The ONLY Lane Delineator engineered from top to bottom for long-lasting life in any climate . . . at a reasonable price

ONLY **Fixatron*** TRAFFIC MARKERS GIVE YOU...
Trade-Mark

1. **FLEXIBILITY**—In all temperature ranges, quick "snap-back" action is assured because of tapered design.
2. **DURABILITY**—Highest quality, synthetic RUBBER (Du Pont Hypalon) and painstaking engineering make this the longest-lasting traffic marker ever produced.
3. **REMOVABLE IN SECONDS**—by one bolt, or nut. Flat base plates can be left in street and markers moved to other areas. Excellent for changing traffic patterns.
4. **SAFETY**—Fixatron's flat base plate cannot divert driver's steering control if accidentally driven over.
5. **DESIGN**—Bolt-retained, spring washer creates ring-like pressure around base preventing displacement if Fixatron is struck.

Model FM-2 Fixatrons are packed 50 to carton. Smaller quantities upon request. Price $4.95 each, F.O.B. Glenside, Pa.

Hypalon Rubber
Galvanized Spring Washer
Stainless Steel Bolt
Cadmium Plated Steel Disk

*Patents Applied For

*Patents Applied For

NATIONWIDE Makers of Fixatron TRAFFIC MARKERS

NATIONWIDE
TRAFFIC ENGINEERING PROD. CORP.
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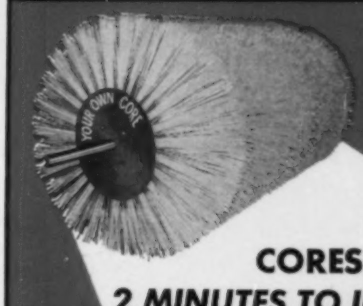
RADAX® PREFABRICATED BROOMS



NO
CORES TO BUY
2 MINUTES TO INSTALL ON
YOUR OWN CORE
WEARS FOR MONTHS
SWEEPS CLEAN
ASK FOR A DEMONSTRATION

PRICES
DELIVERED TO YOUR SHOP

SWEEPER MAKE and MODEL	SR FILAMENT	TYNEX NYLON
MOBILE 54" BROOM	$195.85	$293.15
MOBILE 58" BROOM	$208.30	$310.60
WAYNE 450, 460, 520 and 550	$169.75	$252.50
ELGIN STREET KING	$258.20	$388.10
ELGIN WHITE WING	$258.20	$388.10
ELGIN 20, 30, and 81	$270.15	$399.95
AUSTIN-WESTERN 40	$208.15	$303.55
AUSTIN-WESTERN 60	$230.75	$333.20

RYNAL CORPORATION
114 ST. JOSEPH ST., ARCADIA, CALIFORNIA

RAMBLER For '61

Three New Series of Ramblers to Help Lower the Rising Cost of City Government

Rambler for 1961 offers three series of compact fleet cars—the 100″ American, 108″ Classic and the 117″ Ambassador with a host of new man-saving, money-saving features including . . .

- New die-cast aluminum engine that assures excellent quality, economy and performance for the Classic Custom 6.
- New Ceramic-Armored muffler and tail-pipe—warranted as long as they're in the service of the original municipal agency.
- New molded fiber-glass ceiling that cuts road noise 30% . . . provides insulation against summer heat, winter cold in Classic and Ambassador models.

You *save* with Rambler—America's Economy King!

Rambler American 2-Door Sedan

For 1961 the Rambler American is more compact *outside*, yet has room for six average adults inside. The American Custom swept to first place over all other compacts in the 1960 Mobilgas Economy Run! Also available in 4-door sedan, 2-door business coupe, 2- and 4-door station wagons.

Rambler Classic 6 and V-8 Super Station Wagon

(Also Available: 3-seat, 5-door models)

Here's 80 cubic feet of cargo room for all municipal needs. The Rambler Classic 6 engine block is aluminum die-cast to near flawless perfection not possible before. Standard on Custom models, optional extra on others.

◀ The Rambler Classic and Ambassador 5-door wagons are ideal as combination police or fire department vehicles and emergency ambulances.

- *Because of greatly expanded parts and service facilities, Rambler can assure prompt assistance to municipal maintenance personnel.*
- *No obligation — demonstrators available for on-the-job test from your Rambler dealer, or write direct to American Motors fleet department.*

Classic Deluxe 4-Door Sedan

Fast becoming America's most popular fleet sedan, the Rambler Classic is America's only proved fleet compact car!

SEE YOUR RAMBLER DEALER

or write or phone

Fleet Sales Department—Dept. AC-3

AMERICAN MOTORS CORPORATION

14250 Plymouth Road • Detroit 32, Michigan

(Continued from page 145)

police and fire departments finds itself outpriced.

Recently six serges were placed on a desk, side by side. All were 100% wool, all were 14 ounces in weight, and all were the same shade. Yet they were made of different wool grades, different thread counts, and were dyed in three different ways. Far too much emphasis is placed on fabric prices. Labor is the expensive item. It costs just as much to cut a poor fabric as it does the very best, and the extra wear and appearance far more than compensates for immediate penny savings. A pair of trousers that costs 75 cents more, but gives a year more service is obviously the better buy.

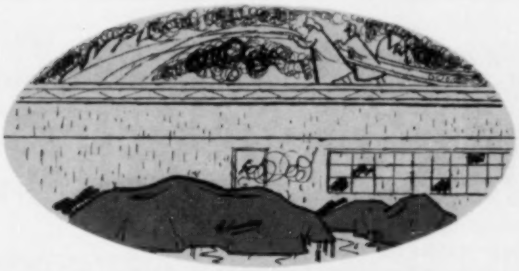
Much of the indecision in fabric selection is caused by misinformation. Make it your first rule to obtain fabric information from fabric mills and uniform information from uniform makers. The second rule should be that a fabric specification should name the mill and the style number, to assure the proper fabric being used. For example, when a uniform bid invitation calls for Franklin Worsted Co. style 373-14-137, the chief knows that he is getting a 14-ounce serge, indigo wool dyed, and made of an excellent worsted stock. Note that the mill, not a dealer or jobber, should be specified. Mills produce what they sell. Style 373 has not changed in a quarter of a century, but lot XYZ from a jobbing firm can and does change from time to time.

In short, police departments are entitled to know what they are spending their money on, and where their fabrics are made. ◄◄

Low Bid Not Required For Concessions

Detroit has the right, backed by a recent court decision, to negotiate so-called concession contracts at its new Cobo Hall. The recent case, Leon H. Lewis vs. City of Detroit *et al*, no. 600911, heard in the Wayne County Circuit Court, involved the concession for the furnishing of labor to exhibitors making use of this exhibition hall.

The decision recognized Detroit's right to select the concessionaires on a basis other than the low bid. ◄◄



Build extra good will on fire calls!

MINIMIZE SMOKE AND WATER DAMAGE with

FULTON SHUREDRY GREEN-BAK SALVAGE COVERS!

You'll create a better public image of your fire department when you use Fulton Salvage Covers. Because these quality covers give property maximum protection from smoke and water damage, they signify an extra measure of care on the part of your firemen. This results in greater good will, support for your department and in valuable community relations.

Features of Fulton Salvage Covers: FINEST QUALITY TREATED DUCK • LIGHT, PLIABLE AND MILDEW RESISTANT • PRESSURE IMPREGNATED BY FULTON'S EXCLUSIVE "DRY-TREATMENT" • WATERPROOFED SEAMS • EASY TO HANDLE IN ANY TEMPERATURE

Fulton Salvage Covers meet the specifications of the National Board of Fire Underwriters, and are approved by Associated Factory Mutual Fire Insurance Companies.

Contact your fire equipment dealer or

Fulton
COTTON MILLS

FULTON MANUFACTURES A COMPLETE LINE OF NYLON SALVAGE COVERS

P. O. BOX 1726 • ATLANTA 1, GEORGIA • TELEPHONE 688-1111 • TWX: AT 24

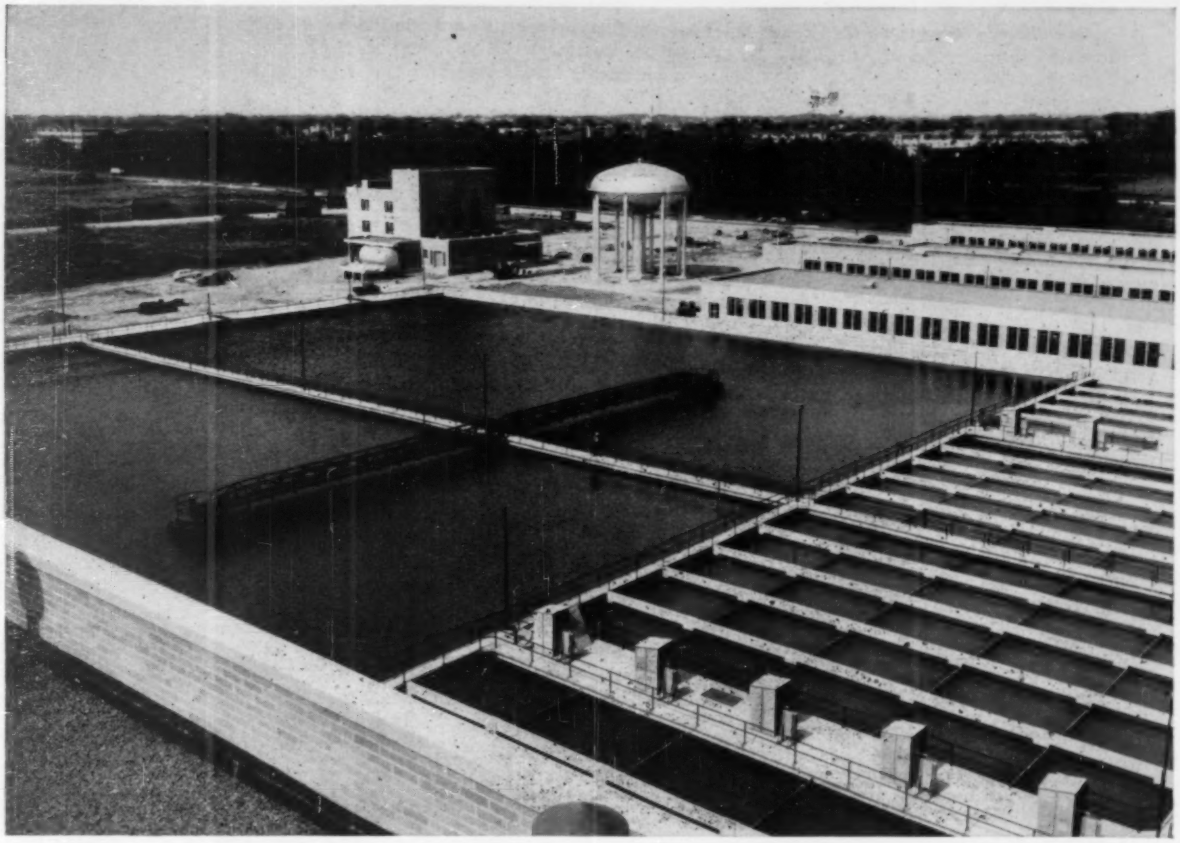
. . . a successful mall by day – a "spectacular" at night!

Gardens, fountains and lighting are now an integral part of the building plan . . . from the start. Lincoln Road Mall in Miami Beach was designed by the internationally known architect, Morris Lapidus, with lighting by Abe Feder. Eleven 60 foot Pylons replace the normal concept of street poles, providing target beams of light that emphasize plant shelters, playing fountains and Mall walks. The night drawing power provided by the exterior lighting dazzles large crowds of sightseers — and many remain to become Mall customers. This new concept is showing a marked influence on the development of similar areas throughout the country.

R
The symbol of better lamps.

The Radiant 1000 watt Mercury Reflector Lamps, with "Pyrex" brand glass envelopes specified by Mr. Feder, are also the perfect solution for many other lighting problems. Buildings, ball parks and airports throughout the country are turning toward the use of Radiant Incandescent and Mercury Vapor Lamps in lighting systems. Radiant Lamps are weather-proof, better in their lasting brilliancy, cheaper in any regular replacement program, and what's more, a joy for the designer to work with. For information about modern outdoor lighting, write or phone Les Deutsch at BIgelow 3-6850.

David A. Foxman
61-11 David A. Foxman, President
RADIANT LAMP CORPORATION
300 JELLIFF AVE., NEWARK 8, N. J.



Philadelphia's push-button treatment plant uses

DORR-OLIVER EQUIPMENT

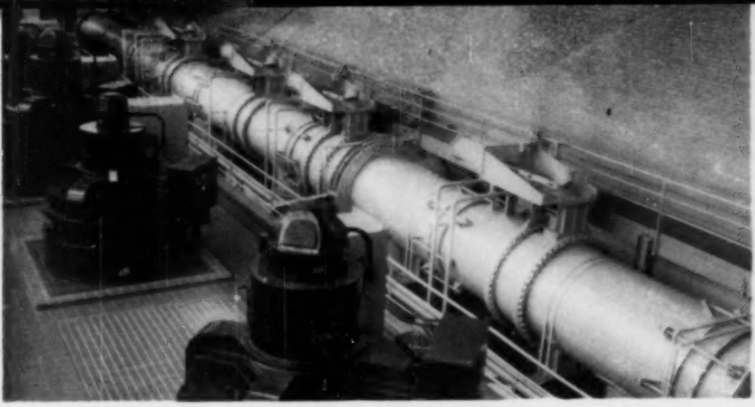
With the completion of the new Torresdale plant, Philadelphia not only fulfills its dream of a completely modern water treatment system, but also possesses a show place of advanced equipment and design ideas.

An extensive system of automatic and semi-automatic controls makes this literally a "push-button" plant. Contributing to its high efficiency are important items of Dorr-Oliver equipment. Four Dorrco Flocculators are installed, each with five rows of paddles 14′ dia. x 174′6″ long spaced on 19′7″ centers. There are also four Dorr Cross-Flow Squarex Clarifiers, each 174′6″ square x 19′6″ s.w.d. Maximum design capacity of the plant, one-half of which is shown above, is 423 MGD. Dorr-Oliver Incorporated, Stamford, Connecticut.

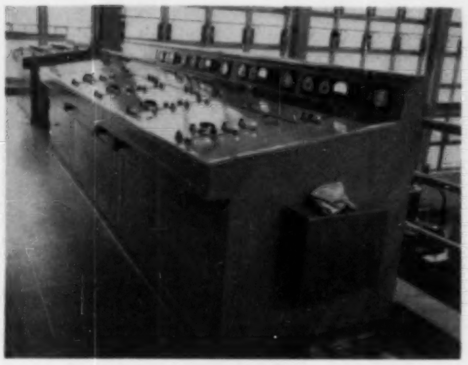
Consulting Engineers: Morris Knowles Inc., Pittsburgh, Pa. Contractors: McCloskey and Company, Philadelphia, Pa.

DORR-OLIVER

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT



More capacity in less space required special attention to equipment location in the relatively long but narrow pumping station.

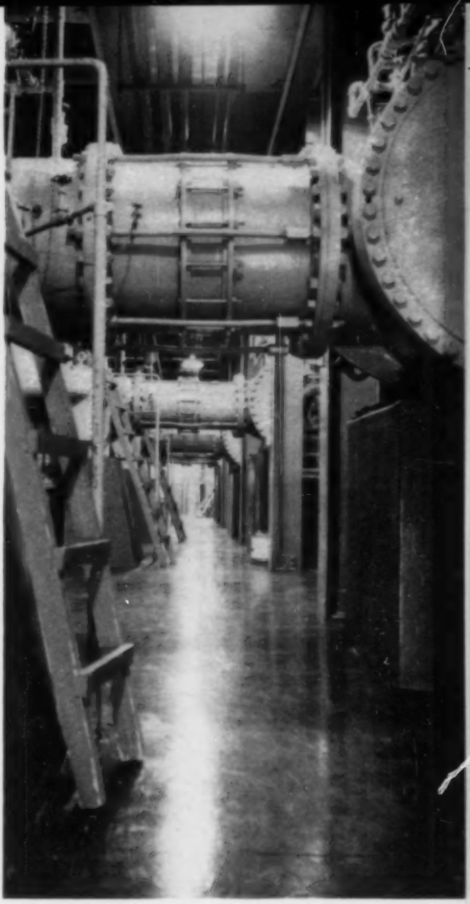


←

Two men per shift operate the station, controlling the automatic equipment from this console overlooking the pump room.

→

This view of the pipe gallery shows the pump discharge connections to the discharge header.



Photos courtesy of Dresser Manufacturing Division

Imagination and engineering ingenuity maintained 50% capacity while rebuilding Buffalo's old pump station to provide . . .

More Water Plant in Half the Space

By **F. SZUNIEWICZ, Jr.**
Director of Water

The problem of reconstructing a 104-year-old pumping station to supply more water in half the space and maintain 50% pumping capacity at all times can send the most intrepid engineer into fits of despair. Add to this, continual heavy vibration caused by a railroad on one side of the site, and the construction of a major interstate highway on the other, and you have the makings of a nightmare.

We knew for some time that Buffalo's original steam-engine-driven pumping facility, the Massachusetts Avenue Station, was rapidly becoming obsolete. By 1956 it pumped only 2.9% of the water furnished to the distribution system.

Action by the New York Thruway Authority taken in 1955 made replacement of the station mandatory. This body, with authority to acquire land by eminent domain, requested about 75% of the station's land and building area to provide right-of-way for the Niagara Branch of the state-wide superhighway, offering $1,250,000 for the space. The city knew that acceptance of the proposal meant demolishing the station but decided to retain sufficient area to build a new station, and retain the unobstructed use of the very valuable suction-tunnel system and discharge tunnel and piping arrangement of the old station.

Space Problems

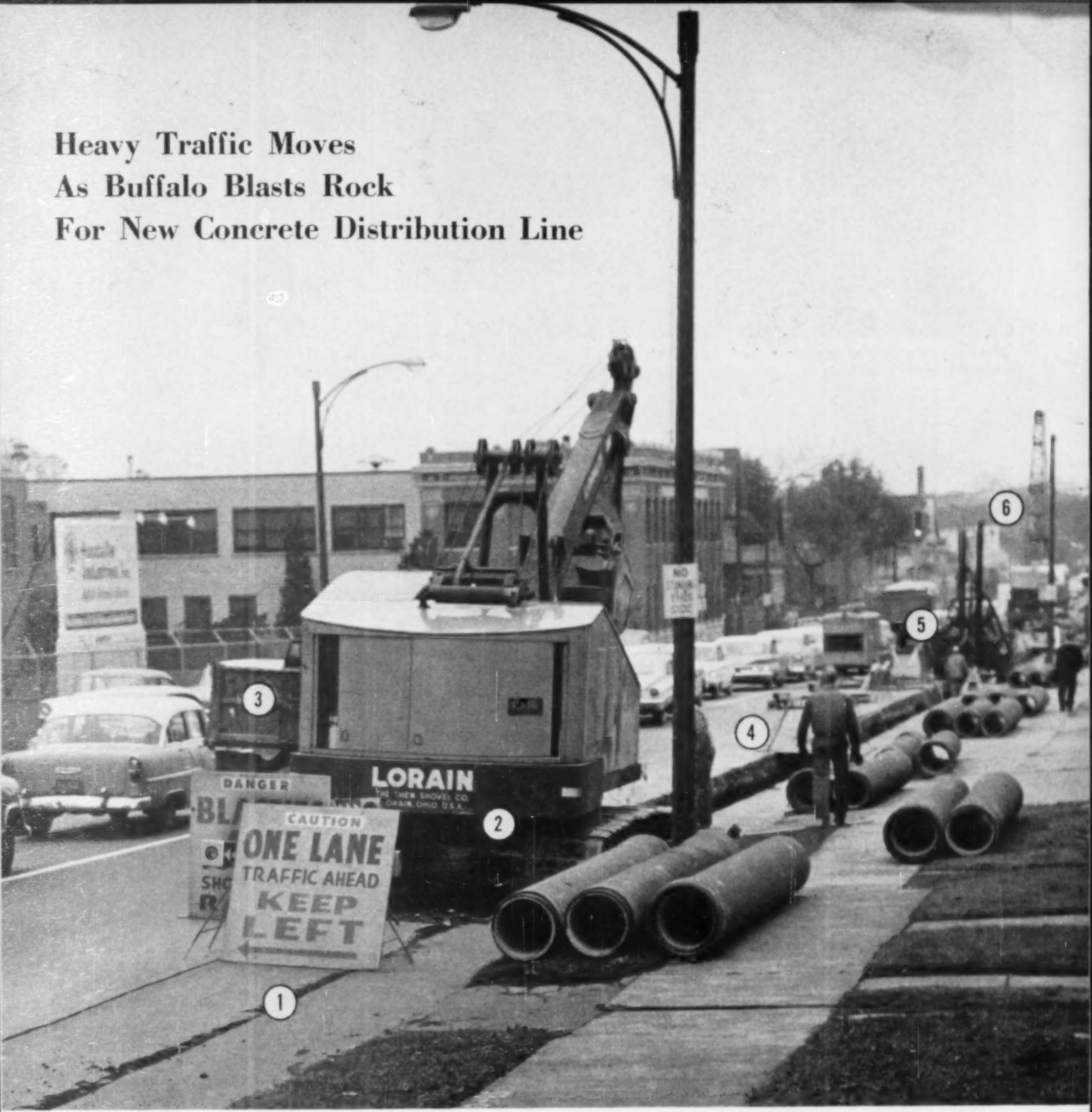
The decision to build the new station in two phases required the contractors to conduct their operations so that a minimum of 50% of the steam pumping capacity of the old station, including boilers, feed pumps, and other auxiliaries, could remain in operating condition during the first stage. This meant beginning construction within the confines of the old station.

Had the same construction area been available to the engineers, few problems would have been encountered. However, only 45 lateral feet remained between the Thruway and the New York Central Railway for completion of this complicated construction job—just half the width of the previous station.

One problem in the new station design was to make certain that the part of the 60-inch longitudinal header section constructed during the first phase would meet exactly the section installed during the second phase. To eliminate any mathematical and engineering problems,

(Continued on page 151)

Heavy Traffic Moves As Buffalo Blasts Rock For New Concrete Distribution Line



East Delavan Avenue in Buffalo gets a lot of traffic on weekdays, and tie-ups were expected when a new 16-inch water distribution line was planned for this street.

But contractor Theodore Bieniek of Eggertsville, N. Y., ran a smooth operation that kept traffic moving at a good pace even while he was blasting through 5 to 6 feet of rock.

It worked like this: Workmen scored asphalt pavement (1), backhoe (2) excavated to rock and loaded truck (3). Working area (4) was kept completely free of refuse and excavated material. Drilling rig (5) drilled rock for dynamite, and truck crane (6) with a clam shell bucket handled the heavy blasting mats, and removed the loose rock.

Following the placing of a sand bed, the installation of the concrete pipe moved at high speed.

Prestressed concrete steel-cylinder pipe was used on this distribution line because it offers long life, continued high capacity, and has the extra strength to take the pounding of heavy traffic.

James N. DeSerio was Consulting Engineer for the project. Francis Downing is Commissioner of Public Works and Frank Szuniewicz, Jr. is Director of Water for the City of Buffalo. The pipe was manufactured by Price Brothers Company with Headquarter Plants in Hattiesburg, Miss., and Dayton, Ohio.

Price Brothers
CONCRETE PRESSURE PIPE

(Continued from page 149)

the engineers specified Dresser couplings since variations of up to several inches could be thus accommodated. This also avoided extreme rigidity of the 225-foot-long header, for the Dresser devices easily absorb vibrations emanating from the Thruway and the railroad traffic. Last but not least, the couplings would provide easy access to the header and butterfly valves for cleaning purposes.

Original piping, electrical conduits, foundations, and similar items in the new station provide for an additional 50-mgd motor pump unit in anticipation of the future expansion of the pumping capacity of the station to 210 mgd. The pumping equipment of the new station consists of two De Laval 50-mgd and two 30-mgd pumps, driven by 2,500-hp and 1,500-hp Westinghouse motors respectively.

The four vertical, dry-pit, centrifugal pumps are connected to 4,160-volt, 3-phase, 60-cycle synchronous motors. The design head for the pumps is 230 feet with a maximum suction lift of ten feet. (The normal suction lift is not more than three feet.) All pumps are connected directly to the 60-inch header within the station; four 48-inch station discharge mains deliver the water from the header to the distribution system.

The distribution system begins at the pumping station at four 48-inch cast-iron discharge tunnels located only ten feet below the railroad tracks. These are coupled at various lengths as they proceed under the tracks and begin to rise up a hill alongside the railroad right-of-way. Dresser bell joint clamps protect all bell and spigot leaded joints, to avoid any possibility of blowout or leakage from vibration.

Emergencies Considered

Station planning included eliminating or minimizing as much as possible the damage consequent upon an inner-station break. Two 36-inch outlet flumes connect the station to the river, maintaining the flood line at a predetermined maximum level. Seven automatically operated sump and dewatering pumps provide a total delivery of 3,500 gpm. All electrical equipment installed below the flood line is designed for submerged operation. The remote control of all the discharge piping valves within the station, and in its immediate exterior, provides for prompt action in isolating a break.

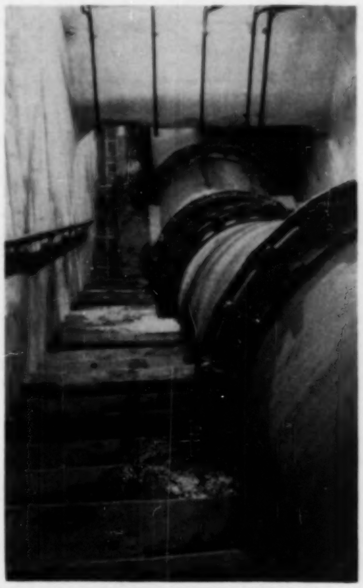
Tripping one Federal Pacific Electric circuit breaker on the low voltage load center at the engineer's operation station closes all discharge piping valves in the station simultaneously. Allis-Chalmers cone valves, automatically closing on flow reversal, are installed in the four 48-inch discharge mains located in tunnels leading from the station, to prevent flooding of the station due to an exterior break and reverse flow from the distribution system.

Pump Protection

The control circuits of each of the four pumping units are so arranged by electrical interlocks that power cannot be supplied to the motors unless the pump casing is primed and the discharge cone valve fully closed. The valve opens automatically when the motor has come to synchronization. In the stop sequence, power is removed from the motor automatically when the discharge cone valve is fully closed.

Each pump motor has six resistance-type temperature detectors installed in the stator windings wired to indicating instrument and alarm contactors. A dial-type indicating thermometer with adjustable alarms is provided for each of the five bearings in the motor pump units. An automatic duplex vacuum priming system continuously maintains prime on all four pumping units.

Throttling the pump discharge cone valve is performed by hydraulic operation critically controlled by means of a pneumatically controlled valve positioner unit. This unit consists of a valve position indicator and a manual loading station.



Bell joint clamps around the bell and spigot leaded joints of the 48-inch distribution lines give added assurance against blowout or leakage from vibration caused by the railroad.

Four 48-inch by 30-inch Simplex venturi meters, each having a capacity of 100 mgd, measure station discharge. Locating the automatic flow reversal cone valve in the throat of each venturi meter permitted the use of 30-inch rather than 48-inch units. The result in savings was more than sufficient to offset the cost of all water-metering equipment in the station.

Welding costs were offset, likewise, by use of Dresser couplings throughout. A 3-kv gasoline-engine-driven generator, connected to an emergency-lighting system, provides light in the event of a power failure. A supervisory system telemeters to the Control Engineer on duty at the Ward Station the operation of the pumps at the Massachusetts Avenue Station. Federal Pacific electrical-control equipment is used throughout the station, with the exception of the high-lift pump motors.

Bigger Role

At present the Massachusetts Avenue pumping station is furnishing 45% of the water delivered to the distribution system at station discharge pressures ranging from 80 to 94 psi depending upon the number of pumps in operation in both stations.

We extended and rearranged the distribution-system piping contiguous to the new station, simultaneously with the construction of the station, by the installation of 36-inch, 48-inch and 60-inch cast iron pipe, in order to improve the reception of the station discharge.

The distribution system, covering an area of 42 square miles, serves a population, within the city, of 530,000 and delivers 22 mgd to the suburbs.

Nussbaumer, Clarke and Velzy, consulting engineers of Buffalo designed the new station and Leonard S. Wegman Company of New York City supervised construction. Frank O'B. Nehin, Water Department supervising engineer, represented the city during the planning and construction of the station.

Although Francis J. Downing, Commissioner of Public Works, and the author put the new station into service on April 15, 1959, the complex reconstruction job was not completed and formally dedicated until a year later, on April 26, 1960. Since that time two employees per shift have operated the fully automatic station—a far cry from the original station built in 1852. ◄◄

SAVED: 203 MAN-HOURS PER DAY WITH THE LOAD-PACKER 600

DAILEY SANITARY SERVICE
NI.2-4784
OVERLAND PARK, KANSAS
SATISFACTION GUARANTEED OR DOUBLE YOUR TRASH BACK
24,000

POINTING WITH PRIDE *at one of his fleet of seven Load-Packer 600's, and his humorous slogan, "Satisfaction Guaranteed or Double Your Trash Back," is Tom Dailey, owner of Dailey Sanitary Service, Overland Park, Kansas.*

LARGE, LOW HOPPER CUTS PACKING CYCLES, SPEEDS COLLECTION

The big 1½-yard, 74-inch wide hopper of the Load-Packer 600 allows fewer packing cycles. This time-saving, money-saving feature is particularly important for collectors with commercial pick-ups.

The big hopper allows crews to work faster. It allows substantial savings in fuel costs, because the number of packing cycles are reduced. It materially helps prolong the life of the engine, packer pump, power take-off, and drive line.

The low loading height of this hopper, 4 inches below the chassis frame, makes the crew's job far easier and far more efficient. And the width of the hopper allows three men to work side by side with no overhead restrictions.

Kansas Collector Cuts Workday in Half by Switching to Gar Wood

In Overland Park, Kansas, the Dailey Sanitary Service has replaced 12 collection units with seven Gar Wood Load-Packers. The result: Crews reduced from 22 men to 15, their workday cut from 14 hours to seven, total man-hours cut from 308 to 105 per day, and a great reduction in maintenance costs.

Tom Dailey attributes this remarkable efficiency to the fast action and powerful compaction of his 18-yard Gar Wood units. Since his collection route is large (14,000 homes, 75 commercial pick-ups), speed of operation is of vital importance. A crew can reload a hopper in just 4 seconds, and its full packing cycle takes only 10 seconds.

Economy was also a big factor in Dailey's switch to Gar Wood. Because of the Load-Packer's fast packing cycle, the truck engine runs fast only about half as long on each cycle as other machines, saving both fuel and wear and tear on packer, engine and chassis. And because of the size of the Load-Packer's hopper, fewer packing cycles are required on any given route.

Like Tom Dailey, more and more refuse collectors are finding that the speed, compaction, and big, wide hopper of the Load-Packer 600 save time, money and manpower.

GAR WOOD INDUSTRIES, INC.

Wayne, Michigan
Richmond, California

Private Refuse Collection Does Work

. . . as proved by actual practice in a Philadelphia suburban area

By **J. McD. MITCHELL***

Occasionally a citizen asks why we do not have municipal collection of refuse, implying that this is the best way to provide such service. My answer is that Marple Township has over 5,000 homes, yet we consider it unusual should complaints concerning refuse collection average one a month. Thus, we do not need municipal collection.

The choice between private and municipal collection depends upon which is most suitable to a particular locality's needs. Having written a comprehensive study of refuse collection and disposal for Culver City, Calif., that led to municipal collection; and managing a township where private collection works exceedingly well, I have experienced success under both systems.

Marple Township, population 19,664 as of 1960, serves as a "dormitory" for Philadelphia workers. It has an area of ten square miles and contains more than 67 miles of improved streets. The area also includes several shopping centers, an industrial tract, and many business establishments.

Collectors Licensed

A five-man Board of Sanitation controls refuse collection in the township. Upon receipt of an application our part-time sanitation inspector inspects the prospective collector's vehicles for conformance to the ordinance. If all is in order the Board issues a collector's license, good for one year.

At present five collectors are licensed annually. Although we have

(Continued on page 155)

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* Mr. Mitchell recently resigned as manager of Marple Township, Delaware County, Pa., to become the city manager of Newburgh, N. Y.

Duplicates of Records Easier

Any number of copies is delivered automatically at six a minute by "dialing" the number desired on the control panel board and pushing the "print" button. The copier is a Haloid Xerox 914 office copier made by the Haloid Co., Rochester 3, N. Y.

It makes copies with the aid of light and electricity. The face of the original document is reflected through the scanning glass onto a charged drum. The charge attracts a plastic black powder which is transferred to paper. The powder image on the paper is fused by heat to produce a permanent picture. It enables our office to give quick-as-a-wink service on requests for duplicate copies of records whether they appear in bound volumes or are in loose form.

JOSEPH CARDINAL
City Clerk
Dearborn, Mich.

Eva Jabour pushed the button and Joseph Cardinal examines one of the Haloid copies.

ALL NEW!
FULLY
TRANSISTORIZED
Detectron
PIPE DETECTOR

In addition to the famous model "505" Detectron now offers its completely new model "808" with the first circuitry developed specifically for use with transistors. It is NOT merely an adaptation of earlier tube circuits.

Efficient under every known operating condition, effective in varying temperatures, thoroughly proven and trustworthy. Superior performance and reliability guaranteed.

EXCLUSIVE FEATURES

▲ Detects Deeper by all comparisons
▲ Automatic Switching for direct connection
▲ High Energy-Transfer-Ratio
▲ Printed Circuits, properly shielded
▲ Separate Oscillator System
▲ Highly Perfected Loop Antennas
▲ Economical Standard Long-Life Batteries
▲ Built-In Battery Testers
▲ Snap-Lok Connecting Handle
▲ Aluminum Cases for maximum protection

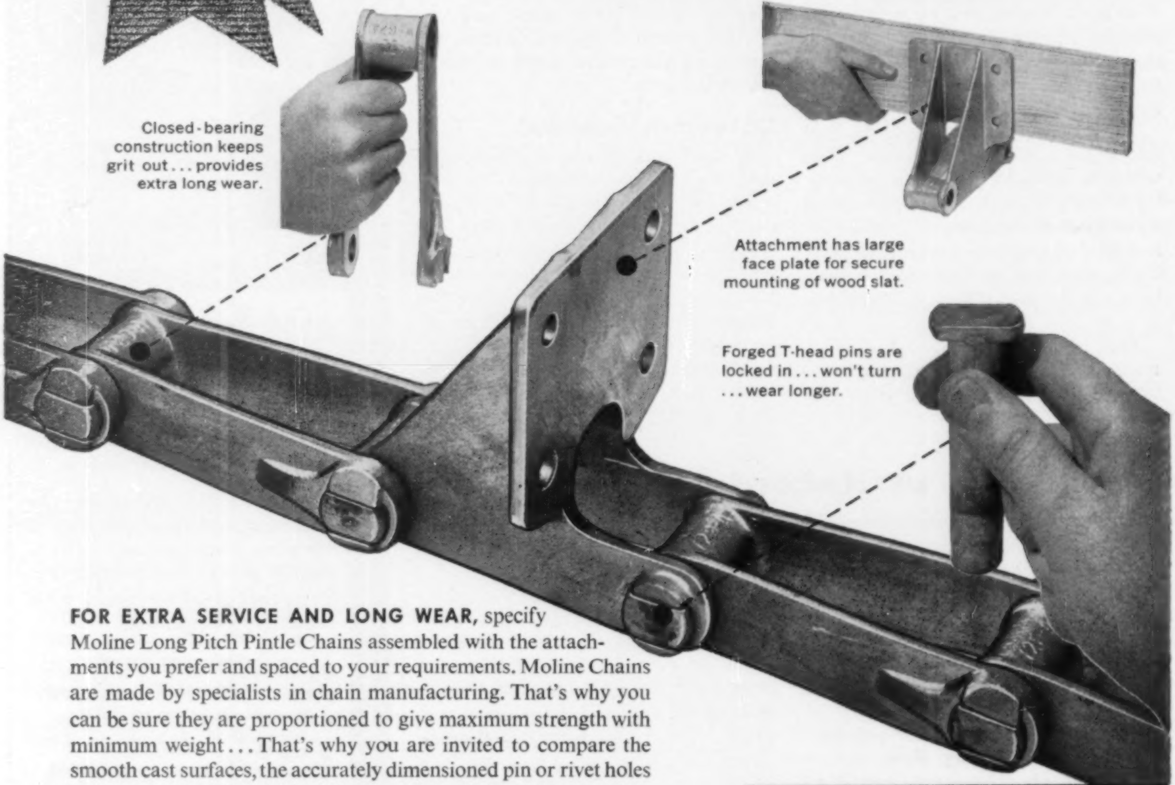
Written Lifetime Guarantee on CMC parts and workmanship

For specifications and prices, write for File No. AC-148

COMPUTER-MEASUREMENTS CO.
Utilities Instruments Div.
12970 BRADLEY, SYLMAR, CALIF.

When selecting chain for rugged service in sewage treatment plants, remember...

Specialization makes a big difference!



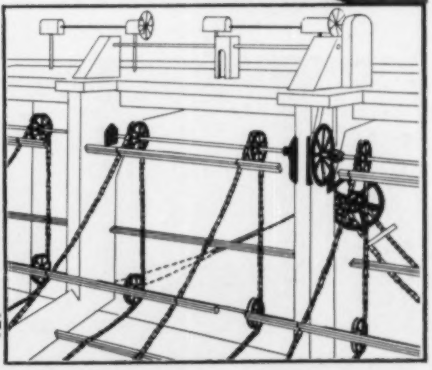
Closed-bearing construction keeps grit out... provides extra long wear.

Attachment has large face plate for secure mounting of wood slat.

Forged T-head pins are locked in... won't turn... wear longer.

FOR EXTRA SERVICE AND LONG WEAR, specify Moline Long Pitch Pintle Chains assembled with the attachments you prefer and spaced to your requirements. Moline Chains are made by specialists in chain manufacturing. That's why you can be sure they are proportioned to give maximum strength with minimum weight... That's why you are invited to compare the smooth cast surfaces, the accurately dimensioned pin or rivet holes and many other features of Moline Chain links with any other make. Moline's "*triple checking*" test procedures guarantee their uniform, high quality.

Moline Chains are interchangeable with "standard" chains of other manufacture and are available in Malleable, Promal or special analysis metal having special corrosion resistance.



For complete information and prices, phone your local Moline distributor or write direct to the factory today!

LEADERS FOR 60 YEARS

Moline
MALLEABLE
Chains

MOLINE MALLEABLE IRON CO.
St. Charles, Illinois
Specializing in the Manufacture of Chains

(Continued from page 153)

no limit as to the number of collectors allowed, variables set up in connection with inspection, road spillage and other controls keeps the number down. The collectors pay a small service charge for the license but we require no performance bond or franchise.

From time to time the inspector makes spot checks on promptness of collection, spillage, proper or neat return of cans, and condition of trucks. He has the authority to issue citations should performance fall below that prescribed by the ordinance. The Board serves as the ultimate judge of poor service, meeting monthly to review trash and garbage collection and other sanitation matters.

Township personnel receive all complaints and refer them to the inspector. He follows up with an on-the-spot inspection and reports to the Board.

Service Choice

The five collectors use a total of 15 pieces of equipment and employ 20 workers on the average, including the firm owners, who are owner-operators. They make twice-weekly collections, picking up trash and garbage at the same time. Since no dumping is permitted within the township, they must go elsewhere to dispose of the refuse. This increases costs slightly. However, the construction of a township incinerator in the near future is expected to hold the price line if not actually reduce it, for dumping will be free.

Costs

Costs to the home owners are both stable and reasonable. The monthly charge for backyard collection and return of containers amounts to approximately $2.25, while curb collection costs about $1.75. Although the township does not regulate fees, we do keep an eye on them. The number of collectors is such as to make the law of supply and demand keep prices reasonable. No significant competition exists between the collectors, as they have "districted" the township. However, this does not prevent an unhappy home owner from changing collectors.

Individual citizens who are refused pick-up of unusual items are furnished with the address of the nearest disposal site.

The sanitation ordinance prescribes the type of equipment required and

(Continued on page 157)

THE ANSWER COMES OUT HERE
MORSE BOULGER

INCINERATOR SELECTOR

A handy, pocket-size device, designed by our engineers to make life easier for you. Complicated computations are eliminated. At a glance you see the type and size Morse Boulger Incinerator Unit required for your specific job.

FREE

One of these tremendous timesavers will be sent free upon request.
(Extra "Selectors" $3 each, 4 for $10).

MORSE BOULGER INC.

Today's engineering plus more than 70 years experience building incinerators of all types and sizes.

80 FIFTH AVENUE
NEW YORK 11, N. Y. Dept. 23
REPRESENTATIVES EVERYWHERE

Member: Incinerator Institute of America
Air Pollution Control Association

Clean Water Meters now in FIVE Minutes —

with VAPOR BLAST
Liquid Honing*

...no acids, solvents, scrapers, wire brushes

Meters and parts at Milwaukee Water Works before and after Liquid Honing.

Modernize *your* meter cleaning — with Vapor Blast LIQUID HONING! Removes dirt, discoloration, scale, paint from corners, crevices, internal parts, chambers, thoroughly and effectively, with *no possibility* of scratching, scoring, or change in precision tolerances. Completely cleans a meter and all parts in less than FIVE minutes . . . Delivers cleaner, brighter water meters that look like new — to build customer satisfaction and confidence in your water meter department *economical* replacement program.

VB Liquid Honing is proving itself in Milwaukee, Cincinnati, and in towns in New Jersey, Georgia, Florida. Get the whole time-saving, money-saving story on VB LIQUID HONING in meter cleaning — or send a meter for Free laboratory demonstration cleaning.

**Vapor Blast and Liquid Honing are Trademarks*

VAPOR V·B BLAST

VAPOR BLAST MFG. CO.
3037 W. Atkinson Ave.,
Milwaukee 9, Wisconsin

Vacuum-clean Pavements

the EASY, LOW-COST *"City Slicker"* Way

Do you have the problem of picking up pedestrian dropped litter in your busy downtown street gutters? On parking lots, shopping centers, playgrounds? Then this compact, Jeep-mounted, **Tarco "City Slicker"** is your **most economical** answer.

The "City Slicker" cleans a 6½ foot path by means of vacuum and air power . . . no brooms or brushes to wear out or service. **Sucks** up and **separates** for quick handling: (1) all kinds of **light bulky litter:** newspapers, paper cups and wrapping, cigarette butts, tin cans; (2) dry **sand**; (3) light fine **dust.** Maneuverable and **safe** to operate in heavy traffic . . . maximum operator visibility. Dusty air cleaned in special air cleaners.

The "City Slicker" is **most economical.** The actual **operating cost is less than ¼ of the curb-mile cost of most other cleaning methods** . . . for every mile you use a "City Slicker" you will cut your present costs up to 75%. By using a "City Slicker" you **release your large power sweeping equipment** for more important dirt sweeping operations for which they are designed.

"City Slickers" are **now performing** money-saving litter collection work in **several large cities.** They can do the same for you. For details see your TARCO dealer or write to us.

TARRANT MFG. CO.
23 Jumel Place, Saratoga Springs, N. Y.

Here's why you get Better Trees and Nursery Stock from COLE NURSERY CO.

IDEAL soil and climate conditions, careful preparation and proper irrigation contribute to the quality of Cole plants. Highly-mechanized systems of planting, cultivating and root pruning produce strong, healthy plants, with more compact root systems, at lower cost. Mechanical digging methods and careful packing assure delivery of Cole nursery stock in good condition with uninjured roots.

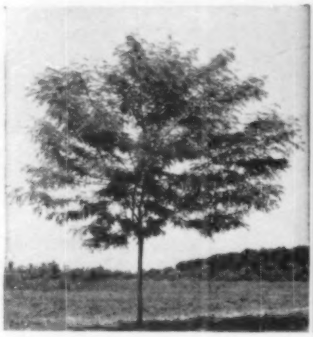
Since 1881 Cole Nursery Company has concentrated on developing and producing only the better varieties and highest quality trees, shrubs, evergreens, hedge plants and ground covers. The extensive experience of more than 75 years is applied at our 1200-acre properties at Painesville and Circleville, Ohio. These large-scale operations are among the most modern nurseries in the industry.

Literally millions of trees and plants, in more than 360 varieties, give you a dependable source of material to meet your needs in large quantity and wide variety. We will be glad to quote on your requirements.

Spectacular SUNBURST
(Plant Patent No. 1313)
The sensational, new two-color tree with brilliant yellow foliage on branch tips. It appears to burst with bloom all summer long.

These patented Cole Originals help solve your landscaping and maintenance problems

Although each variety is unique, these trees have all the best qualities of the Honeylocust. They transplant easily, require no staking, are exceptionally strong, hardy and relatively fast growing. Of many thousands grown, only a very few have exhibited small, embryo thorns which drop off or are absorbed by the growing tissue of the tree. They are widely adaptable to almost any soil or climate, readily withstand ice and storm damage, drought and poor drainage. They cause no ground-litter, require no fall clean-up or leaf removal. You'll never buy trees that cost you less for maintenance, damage or replacement.



Cole's New IMPERIAL
(Plant Patent No. 1605)
The graceful, spreading, new Honeylocust that grows strong and straight *without staking*. A favorite of landscape men and tree experts.

Cole's new SKYLINE
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Distinctive, stately variety with strong trunk and shapely crown. *Needs no staking*. Dark green foliage has heavy, leathery texture.

Cole's New MAJESTIC
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A clean, graceful, symmetrically-branched tree. Produces a straight, sturdy trunk and compact crown *without staking or special trimming*.

Cole's New TALLHEDGE
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A thornless, glossy Columnar Buckthorn that grows to 12 feet. Ideal for tall, narrow, dense hedges or screens. Bears colorful berries.

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360 VARIETIES
WRITE FOR CATALOG

THE COLE NURSERY CO.
PAINESVILLE, OHIO

OHIO'S LARGEST
WHOLESALE NURSERY
ESTABLISHED 1881

(Continued from page 155)

necessary features. But the collectors are just as interested as the township in acquiring modern and efficient trucks and collection bodies. They must also obtain liability and property-damage insurance and submit certificates to the inspector at the time of inspection.

Disputes do arise between collectors and one may attempt to put the "squeeze" on another. The township maintains a hands-off policy unless service to the residents is affected. The Board then steps in and the licenses become subject to revocation unless the dispute is settled quickly and satisfactorily.

This successful operation of private refuse collection, though simple, means good service at low cost to the home owners and no cost to the township, since the license fee covers our costs. Above all, it provides customer satisfaction. ◄◄

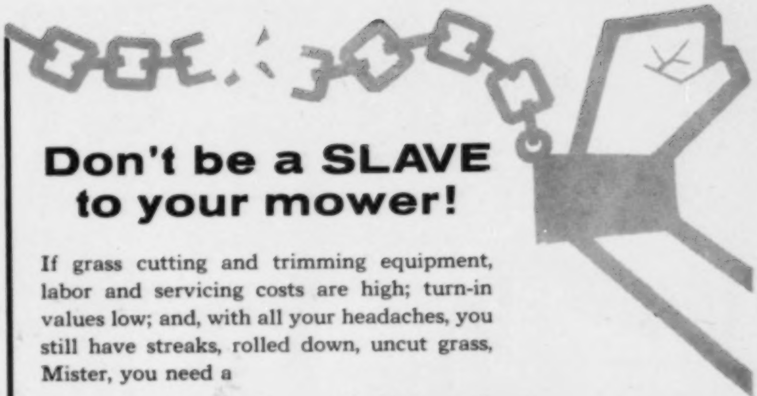
Prize-Winning Civic Center Moves Closer To Completion

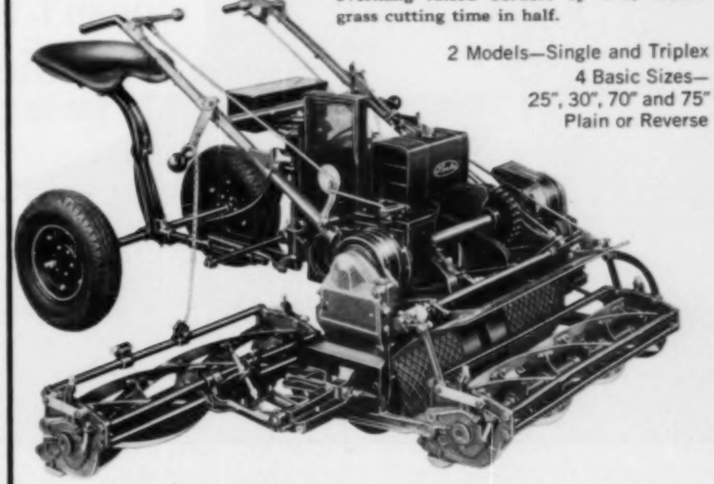
The new $15,000,000 prize-winning civic center, Norfolk, Va., moved closer to completion recently as architectural design of the second stage goes on the drafting boards of Vincent G. Kling, architect, Philadelphia.

This portion will embrace three additional buildings that complete the Center. A high-rise municipal office tower will replace the present City Hall; a low building will house the corporation courts; and a small service structure will contain mechanical and utility equipment for both buildings and a maintenance shop to serve the entire center. The first unit, the $5,000,000 municipal courts, police headquarters and jail building was formally opened on February 18th.

The center will be completed early in 1963 according to City Manager Thomas F. Maxwell.

The final designs for the new buildings will preserve the spirit of the award-winning master plan for the civic center which was prepared in 1958. This plan, which included a Board of Education building that has been deleted from the present program, envisioned a total of six high and low-rise buildings grouped around a central, landscaped plaza. The design, prepared jointly by Vincent G. Kling and Oliver and Smith, associated architects, received a citation for excellence in a nationwide competition sponsored by *Progressive Architecture* magazine. ◄◄





Don't be a SLAVE to your mower!

If grass cutting and trimming equipment, labor and servicing costs are high; turn-in values low; and, with all your headaches, you still have streaks, rolled down, uncut grass, Mister, you need a

Lifetime
Locke **POWER MOWER**
and trimmer

Lockes with their exclusive "floating" action, "finger-tip" controls, perfectly balanced, fully synchronized chain driven exclusively designed reel-blade-cutters, overhang raised borders by 1/3; reduce grass cutting time in half.

2 Models—Single and Triplex
4 Basic Sizes—
25", 30", 70" and 75"
Plain or Reverse

A Locke demonstration will prove their versatility, practicability and economic value. Arrange for it today! Call your Locke Service Dealer. Buy a "Lifetime" Locke.

Locke **POWER LAWN MOWERS**
1315 Connecticut Ave., Bridgeport 1, Conn.
A product of The Locke Steel Chain Co.

Send for these New Locke data sheets

Now is the time to take your grass cutting costs seriously. ASK YOUR LOCKE Service Dealer for the facts, or write.

Locke Mower Div.
The Locke Steel Chain Co.
1315 Connecticut Ave., Bridgeport 1, Conn.

Gentlemen:

☐ We want a demonstration. Have your Dealer phone.
☐ Send your latest literature.

NAME ______
COMPANY ______
ADDRESS ______
CITY ______ ZONE ______ STATE ______

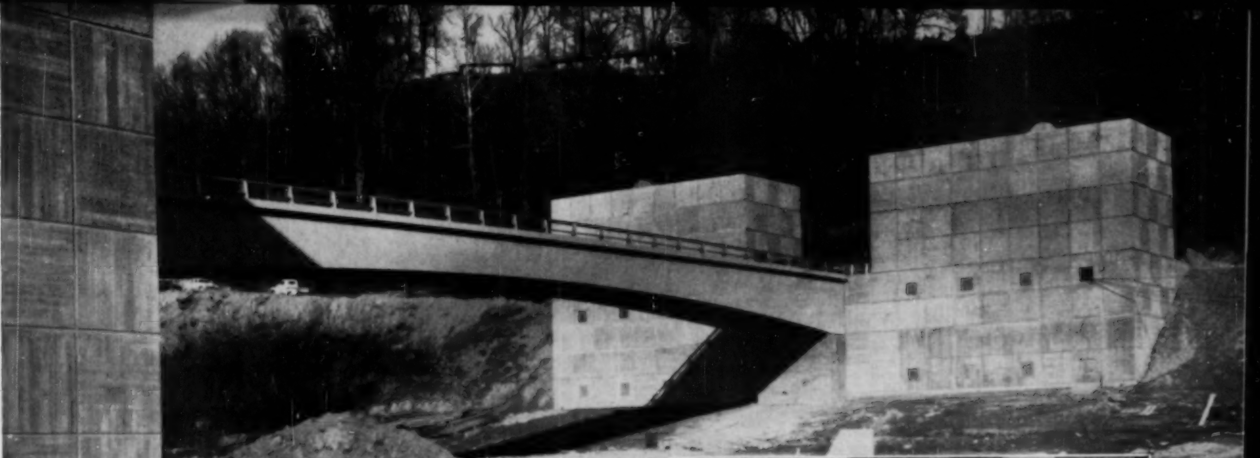
"Hey, Hartley–
doesn't this white pipe
ever die of old age?"
DANGER
MEN
WORKING

Hardly! You see, Transite®, the *white sewer pipe,* is made of ageless minerals—asbestos and cement. The asbestos fibers, each with the tensile strength of piano wire, reinforce the cement to form a stone-like pipe that is rugged, tough and durable. Transite is also steam-cured under high pressure, adding further to its strength, durability and chemical stability. And, being non-metallic, there's no chance of oxidation weakening its structure. What's more, Transite's high crushing strength can withstand the heavy overburden, ground movement and earth shocks that continually challenge the ability of sewer pipe. When you add to this Transite's long lengths, tight joints and naturally smooth interior, it becomes obvious that this white sewer pipe was designed to offer greater total life expectancy.

For all the facts, write for special data file. Please indicate if you are a city official, engineer or contractor. Address: Johns-Manville, Special Sewer Data, Box 14, AC-4, New York 16, N. Y. In Canada: Port Credit, Ont. Cable address: Johnmanvil.

The Transite Pipe shown in this 23-year-old photo is still providing trouble-free service.

JOHNS-MANVILLE
TRANSITE SEWER PIPE
JM



Graceful and efficient, the new bridge spans the canal to the Little Falls pumping station on the left.

→ *Installing the tendons, the contractor proceeds from the top deck of the formwork.*

Why Washington, D. C.'s water system has built the nation's . . .

Second Longest Prestressed Span

. . . and how the structure was erected

By **DAVID I. HENDERSON,** Project Engineer
Black & Veatch, Consulting Engineers

The second longest prestressed concrete span in the United States is located on a dead-end street. This 216-foot span provides vehicular and pedestrian access to the newly-completed Little Falls Pumping Station near Washington, D. C. This station and all other water supply and treatment facilities for the District of Columbia fall under the jurisdiction of the Washington Aqueduct which is a division of the Washington District of the U. S. Army Corps of Engineers.

The pumping station site lies on the Maryland shore of the Potomac River near Little Falls. The river flows through this area in a shallow, steep-walled gorge with a narrow flood-plain on each shore. Along the Maryland shore the Chesapeake and Ohio Canal parallels the river, bisecting the flood plain. The canal is being preserved as an historical and tourist attraction by the National Park Service.

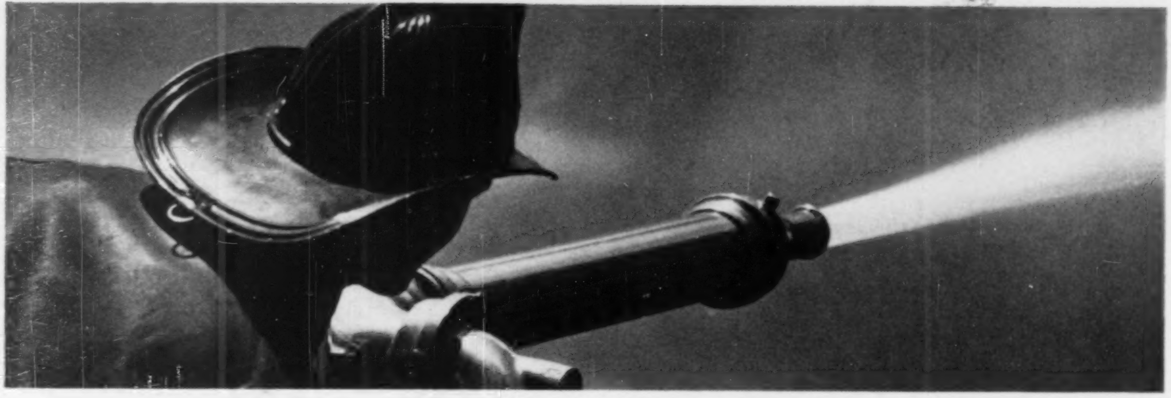
The Problem

Access to the pumping station presented one of the major problems. The maximum recorded flood crest at Little Falls is approximately 20 feet above the flood plain. Studies by the Corps of Engineers indicate a flood crest almost 30 feet above the flood plain might be attained. The most favorable location for the pumping station was slightly offshore of the flood plain.

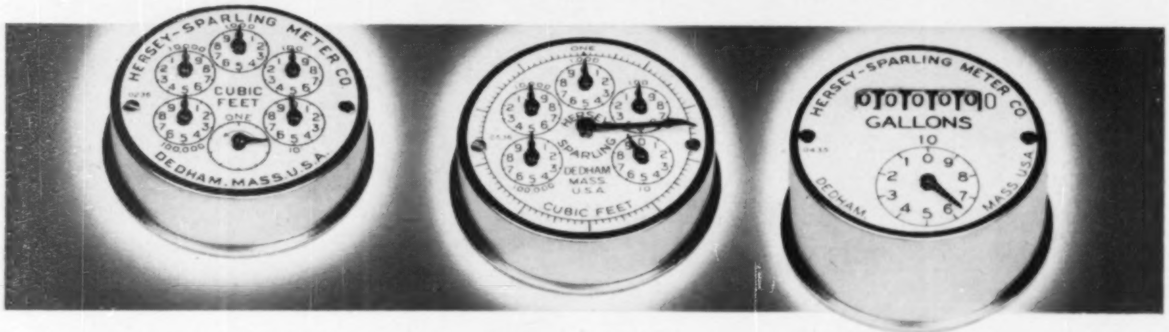
A bridge above flood level, spanning from the Maryland shore to the pumping station, supplied the best solution to the access problem. Preliminary designs in reinforced concrete involved bridges of three or four spans and varied from about 200 to 250 feet in length. It was necessary to preserve the canal in its original condition and location and to provide space for the future George Washington Memorial Parkway between the canal and east slope of the river gorge. The preliminary layouts were reviewed by the Corps of Engineers, the National Park Service which had jurisdiction over the construction site, the U. S. Fine Arts Commission and the U. S. Bureau of Public Roads in charge of planning the George Washington Memorial Parkway. These groups decided that none of the preliminary bridge layouts were suitable because they did not provide the proper balance between span lengths while supplying the necessary clearances for the canal and the future parkway.

(Continued on page 161)

When completed in 1958, this bridge had the longest prestressed concrete span in the U. S. This distinction was lost in 1960 when a 320-foot span was completed near Brewerton, N. Y.



For Instant Unimpeded Water Flow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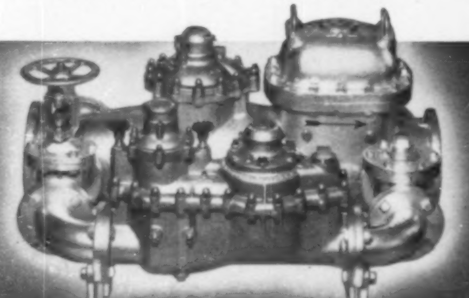
For Accurate Measurements of ALL Rates of Flow — You Can Depend on a



Sizes 6", 8" and 10" of Model FM-CT are listed as standard under the re-examination service of Underwriter's Laboratories, Inc. and approved by Factory Mutual Laboratories for use in Factory Mutual insured properties, also listed by Underwriter's Laboratories of Canada.

HERSEY

Detector (FIRE SERVICE) Meter — Model FM-CT

This compound type meter combines a Proportional Meter and an Automatic Valve on the main line with an all bronze Compound Meter on the by-pass. Result: all rates of flow are measured with minimum loss of head and with minimum obstruction when full pipe capacity flow is demanded for an emergency, such as extinguishing fires.

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HERSEY PRODUCTS
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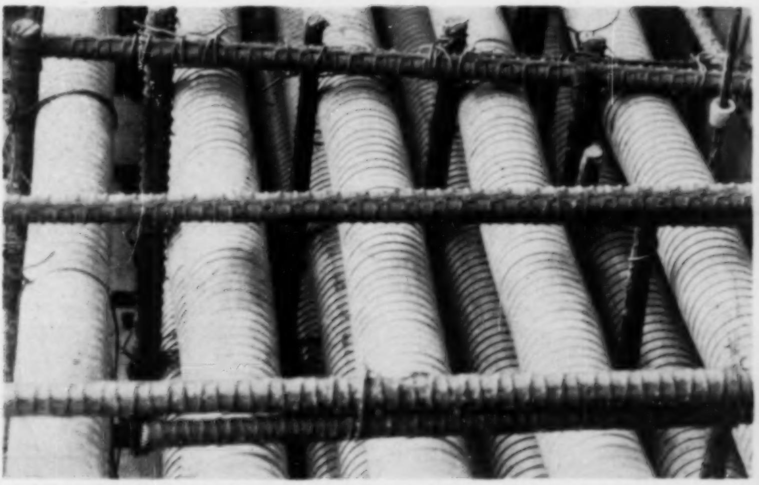


Girder forms enclose this matrix of tendons.

The jack stretches the tendons to apply the prestressing force.

(Continued from page 159)

At the suggestion of the Washington Aqueduct engineers, Black and Veatch as architect-engineer for the project investigated a single span, prestressed concrete bridge. Preliminary designs indicated that such a bridge would be feasible and would provide the necessary clearances. The prestressed design, 216 feet long, spanned both the canal and the eastbound lane of the future parkway. We located the westbound lane of the parkway farther up the slope of the river gorge at the approximate elevation of the east end of the bridge, with the east bridge abutment in the center dividing strip of the parkway. Twin concrete structures housing the 34.5-kv switchgear required for the power supply of the pumping station flanked the abutment.

The bridge design consists of a simply-supported structure with a heavy cantilevered concrete counterweight at each end to reduce the dead-load midspan moment and permit the desired flat-arch profile. Since the bridge is intended for vehicular access only, a one-lane roadway 16 feet wide designed for AASHO H20-S16 truck loading satisfies the requirements. Concrete with an ultimate strength of 4,000 psi (working stress: 1,600 psi) and prestressing steel with an ultimate strength of 240,000 psi (working stress: 144,000 psi) form the component parts of the structure. Preload Engineers, Inc., retained by the architect-engineer, to assist in the bridge design, selected a hollow box girder section with a midspan depth of seven feet, increasing to 12 feet at supports. A 12-inch top deck and five-inch lower slab abut two 16-inch girders which form the side walls of the box and contain the prestressing elements. The prestressing cable, draped in a parabolic profile between the supports, is located near the bottom of the girders at midspan and near the top at the ends.

The reinforced-concrete water-discharge conduit from the pumping station lies directly beneath the bridge centerline on bedrock and supports the bridge piers. At the west end, the bridge reaction is transferred to the pier through a fixed bearing plate which prevents longitudinal movement while allowing angular rotation. At the east or substation end, a heavily reinforced concrete pendulum rocker permits both longitudinal and angular movement. At each end a reinforced concrete counterweight of almost 700 tons projects beyond the support. A large water-tight recess in the pumping station contains the counterweight at the west end; at the east end it lies between the substation structures.

Construction

Construction began in July 1955. The access bridge was necessarily one of the later items on the entire project which had a completion time of 900 days. Prestressing, Inc., the prestressing contractor, requested that they be allowed to use their own patented P. I. prestressing system rather than the specified Leonhardt system. The P. I. method uses post-tensioned high-strength steel wire, one-fourth inch in diameter, fabricated into parallel-lay cables or tendons, each composed of several wires which are placed through cable enclosures concreted in the bridge girders. The prestressing force is applied to the tendons through duplex buttons formed at the ends of each wire. Prior to the heading process, the wires are inserted through drilled holes in an anchor ring which is a heavy steel cylinder. The inner upset heads on the wires bear against the end surface of the anchor ring. The prestressing force is applied through a stressing assembly to the outer upset heads. After application, shims are placed between the anchor ring and a bearing plate at each end of the bridge, anchoring the tendons.

To permit this prestressing system change, the plans and specifications were revised by the subcontractor, reviewed by the architect-engineer and approved by the District Engineer. The physical dimensions of the bridge were not changed. Four heavy steel bearing plates, two at each end of the bridge, at which the prestressing tendons terminated were

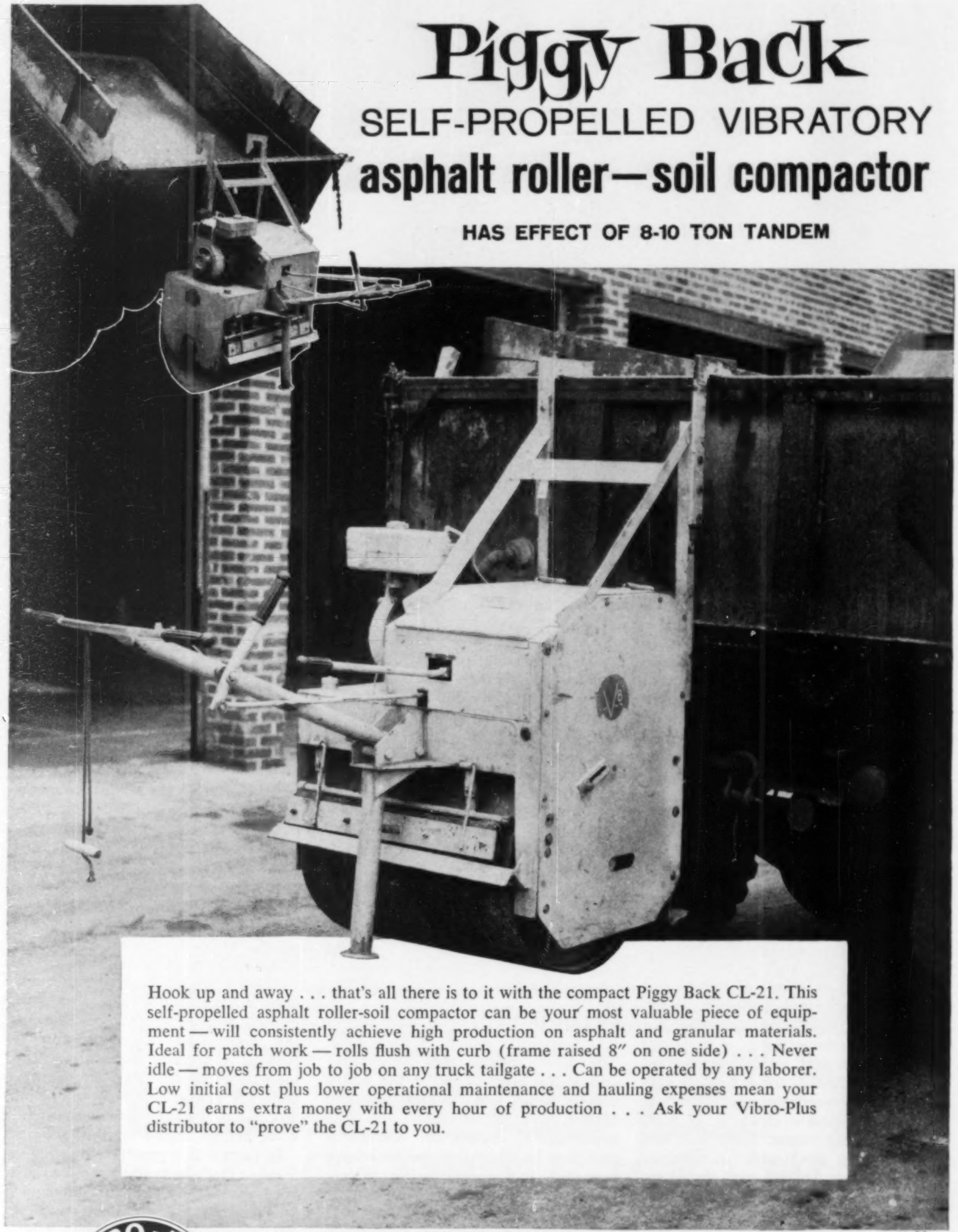
(Continued on page 163)

Piggy Back

SELF-PROPELLED VIBRATORY

asphalt roller—soil compactor

HAS EFFECT OF 8-10 TON TANDEM



Hook up and away . . . that's all there is to it with the compact Piggy Back CL-21. This self-propelled asphalt roller-soil compactor can be your most valuable piece of equipment — will consistently achieve high production on asphalt and granular materials. Ideal for patch work — rolls flush with curb (frame raised 8″ on one side) . . . Never idle — moves from job to job on any truck tailgate . . . Can be operated by any laborer. Low initial cost plus lower operational maintenance and hauling expenses mean your CL-21 earns extra money with every hour of production . . . Ask your Vibro-Plus distributor to "prove" the CL-21 to you.

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STANHOPE, NEW JERSEY

WORLD'S LEADING MANUFACTURER OF VIBRATORY EQUIPMENT FOR OVER TWO DECADES.

(Continued from page 161)

placed in temporary jacking pockets about five feet square by seven feet deep at each corner of the bridge. The prestressing force was applied through 375 one-fourth-inch-diameter steel wires located in 15 tendons in each girder. Each tendon of 25 wires was enclosed by a two-inch flexible metal hose. The tendons were arranged in five layers of three each.

In the spring of 1958, the contractor erected the scaffolding to support the concrete forms for the bridge box girder. A trestle fabricated from heavy timbers supported the plywood formwork. The trestle rested directly upon the reinforced-concrete discharge conduit from the pumping station. The box girder forms were placed on a 20-ton-capacity screw jacks spaced at ten-foot intervals along the trestle to permit an orderly decentering procedure at the proper time.

The bottom slab of the box was poured first, followed by the girders and then the top slab. "Windows" were provided in the sides of the girder forms at those locations where the tendons were somewhat above the bottom of the girders, in order to simplify placing of concrete in the girders below the tendons. The box was then poured, except for a 16-inch closure joint at midspan to minimize shrinkage.

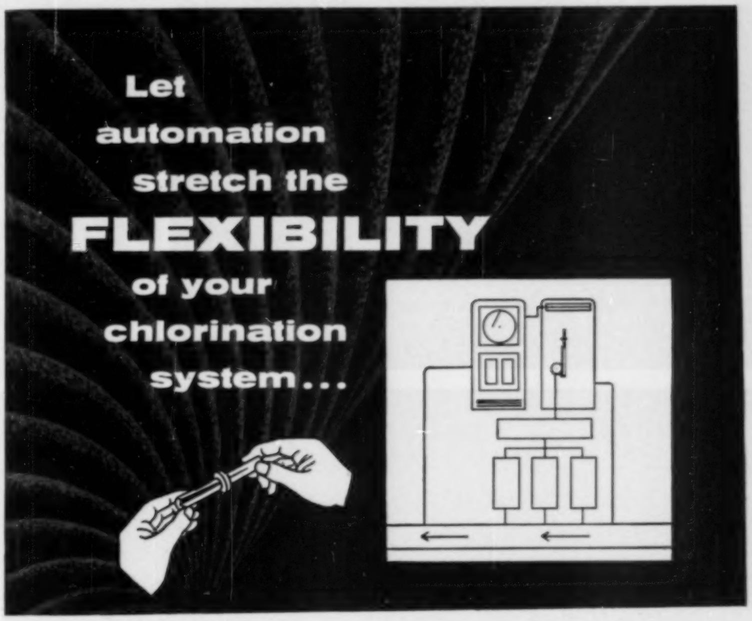
We delayed pouring of the closure for three weeks. The following day Stage I of the prestressing was applied, consisting of stressing two tendons in each girder to minimize shrinkage cracks.

Stage II of the prestressing procedure was permitted only after the concrete in the midspan closure joint had reached a cylinder strength of 3,750 psi. Hydraulic jacks of 150-ton capacity applied the load simultaneously to the tendons at each end. Hydraulic pressure for the jacks was provided by small gasoline-engine-driven hydraulic pumps capable of developing 10,000 psi. The jacking force varied from 110 to 115 tons per tendon, each tendon elongating about 18 inches.

After Stage II was completed, sufficient prestress (80%) had been applied to carry the dead load of the bridge. Deflection calculations indicated that this was a favorable time to decenter the supporting falsework. We predicted that when the supports were removed, the bridge at midspan should settle about one inch and the counterweights should rise about one-fourth inch at their outer ends. They had been poured on and supported by compacted sand fills. The contractor removed the sand when the counterweights rose. Observed deflections approximated the predicted values.

Stage III of the prestressing followed decentering and consisted of tensioning the remaining three tendons in each girder. Cement grout applied under pressure filled the void space in each tendon enclosure to prevent corrosion of the prestressing wire and to bond the wires to the box girder. The contractor then concreted the jacking pockets. Two weeks later the top eight inches of the counterweights were poured to the finish grade and the bridge was complete except for bush-hammering the outer surfaces of the girders to expose the concrete aggregate. This removed all concrete form marks and provided an attractive surface finish.

The prestressed bridge economically solved the access problem to the pumping station while providing for the preservation of the canal. Twenty years ago this solution would not have been possible because prestress was then in its infancy. ◄◄



W&T COMPOUND-LOOP CONTROL

Compound-loop Control by Wallace & Tiernan maintains chlorine residuals automatically—provides utmost flexibility in arrangement and process control.

Chlorinator feed rate is adjusted by two signals: one from water flow, the other from continuous, automatic residual analysis. Since feed rate is the product of these signals, Compound-loop Control gives you a range of greater than 100:1. No matter how much flow or demand changes, your system always maintains the selected residual.

Regardless of the size, type, or physical layout of your system, Compound-loop Control adapts readily. Electric, pneumatic, or variable vacuum control signals can be used. And you can install Compound-loop Control as a package or convert to it, component by component, as your system expands.

For more information, write Dept. S-145.00

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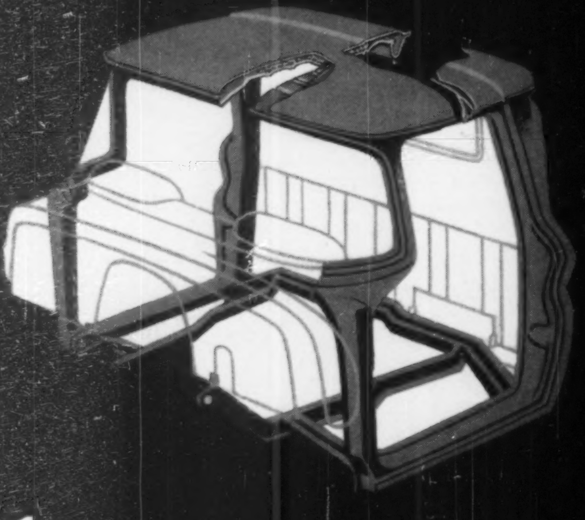
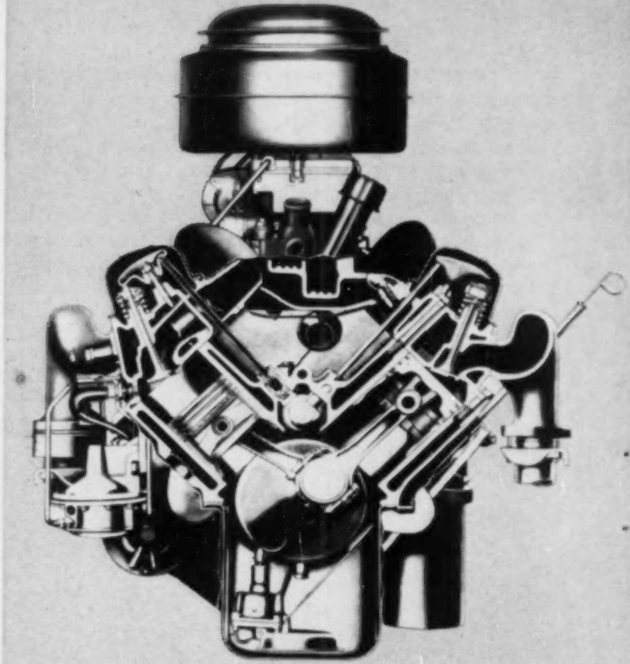
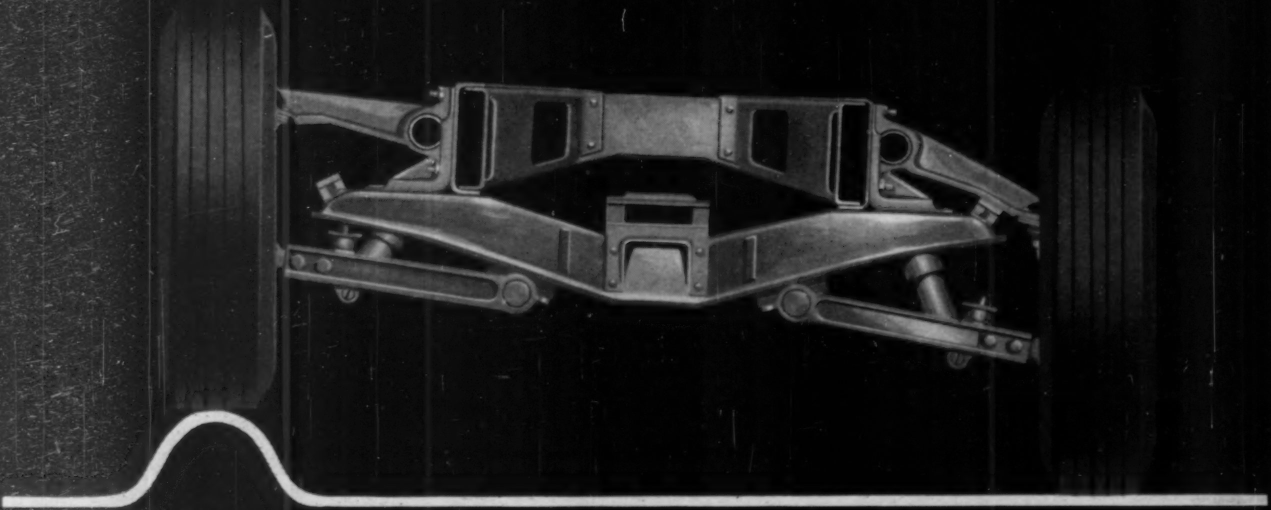


1 Extra strength where it counts gives Chevy cabs rock-solid rigidity to stay in shape years longer.



2 Chevy's powerful, efficient Taskmaster V8 combines big-truck might and muscle with top operating economy.



3 Independent Front Suspension with "walking wheel" action paves the way to bigger earnings with a smoother ride and reduced maintenance expense.

CHEVY BUILDS 'EM BETTER (TO BOOST YOUR EARNINGS)!

DEEP-DOWN DURABILITY SAVES YOUR DOLLARS IN 1961 CHEVROLET MEDIUM-DUTY TRUCKS

Here are Chevy components that add to tough-truck durability and earning ability; the *strong* reasons why a Chevrolet middleweight can take plenty of punishment—and keep on taking it. Here's why these rough-and-ready haulers squeeze bonus earnings out of tight budgets!

1 Take a look at the Chevy cab (pictured at left). It's built *solidly* to take any poundings your rough-and-tumble runs can throw its way; to stay in shape for years, lengthen effective truck working life and minimize maintenance expense. Notice the husky longitudinal sills that reinforce the cab underbody to reduce vibration and provide a solid foundation for cab sheet metal. Check the extra sturdy door openings with box-section pillars and sills to keep doors weather-tight and in lasting alignment. See how the husky box-section pillars support the rigid, double-walled roof panel for greater safety and maximum cab strength. (And this cab is just as *comfortable* as it is rugged!)

2 More evidence of Chevy's deep-down strength and toughness can be found beneath the hood. There you'll find the *261-cubic-inch Jobmaster 6* —a work-proved dollar-saver. Its sturdy components—forged steel crankshaft, high-alloy inlet valves, precision bearings, hard-faced exhaust valves with Rotocoils, all-weather electrical system and many more—are solid assurance of maximum efficiency and economy. Or the big *283-cubic-inch Taskmaster V8* illustrated at left (optional at extra cost) to supply plenty of torque to move maximum payloads with minimum strain or wear. Low maintenance costs stem from features like aluminized high-alloy inlet valves, hard-faced exhaust valves with Rotocoils and Moraine 400 precision bearings.

3 Chevy's bump-beating Independent Front Suspension system provides still another reason for dollar-saving durability. Tough, friction-free torsion springs cushion the ride; ruggedly built control arms guide each wheel to give sure, stable handling; sturdy, custom-tailored shock absorbers further reduce road shock and offer maximum ride control. The result is a new kind of smooth truck ride that lengthens truck life; cuts wear and tear to reduce maintenance. These reasons for ruggedness go on and on to help reduce your costs. They're all the result of Chevy's *deep-down durability*. See your dealer about it soon. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET POWERMATIC, developed especially for big truck duty, provides fully automatic driving ease for all Series 60 and 60-H models (optional at extra cost). With six forward speeds in four driving ranges, plus torque converter action for getting under way and cushioning drive-line shifting shocks, Powermatic adjusts automatically to load and road conditions.

1961 CHEVROLET STURDI-BILT TRUCKS CHEVROLET

Madison Plans Its Street Types

Future streets in Madison, Wis., and the adjacent area will be designed on the basis of a master plan which differentiates the street types in terms of their function. The land subdivision regulations, part of the General Ordinances of the City of Madison, specifically state that in any new subdivision the street layout shall conform to the arrangement, width and location indicated on the Official Map, Master Plan, or component Neighborhood Unit Development Plan. In areas where such plans have not been completed the streets shall be designed and located in proper relation to existing and proposed streets, to the topography, to such natural features as streams and tree growth, to public convenience and safety, to the proposed use of the land to be served by such streets, and to the most advantageous development of adjoining areas.

The city's recently published manual on land subdivision, prepared by the Madison Plan Commission under the direction of Walter K. Johnson, Planning Director, calls for an arrangement consisting of major, collector and minor streets. These in turn comprise five basic types designated as boulevards and parkways, major streets, collector streets, minor streets, and marginal access streets. The illustration shows typical cross sections of these streets.

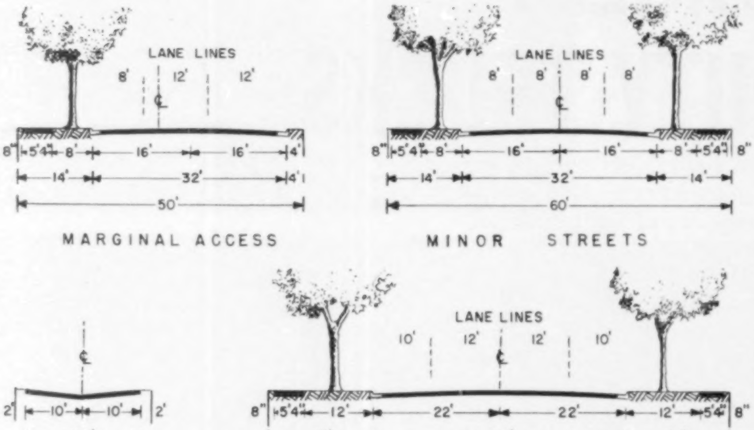
The selection of each is based upon its prime function. The major streets and highways, used primarily for fast or heavy through traffic, must be properly integrated with the existing and proposed system insofar as practical. Similarly, the collector streets, which carry traffic from the minor to the major streets, must be properly related to the mass transportation system, to special traffic generators such as schools, churches and shopping centers, to concentrations of population, and to the major streets into which they feed.

On the other hand, minor streets, used primarily for access to abutting properties, must conform to the topography and be so designed as to discourage through traffic and permit the design of efficient storm and sanitary sewerage systems. Alleys are required in commercial and industrial districts but are not allowed in residential areas.

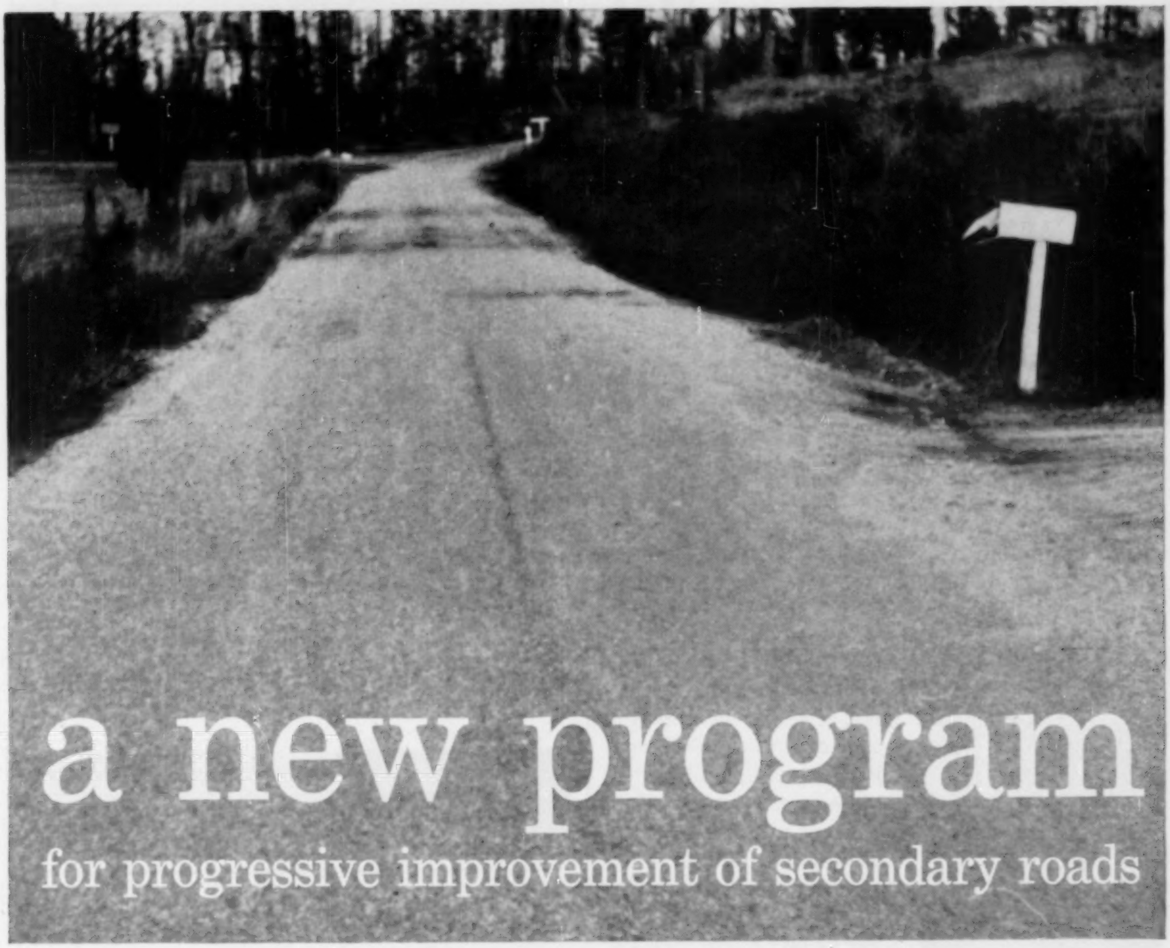
The cul-de-sac streets designed to have one end permanently closed shall not exceed 1,000 feet in length and the circular turn-around must have a minimum right-of-way diameter of 120 feet and a minimum outside curb diameter of 90 feet. The subdivision regulations pertaining to street design include such safeguards as:

- **Maximum grades of 6% on major and collector streets; 8% on minor streets and alleys.**
- **Specified radii of curvature, both for vertical curves and horizontal curves, with a minimum tangent of 100 feet between reverse curves on major and collector streets.**
- **Street names that do not duplicate or are not similar to existing street names.**
- **The dedication of sufficient land to complete a street where a half street or part of a street is already dedicated or platted adjacent to the tract being subdivided.**

These regulations are not a magic formula for the right solution to every problem. However, they will prevent further occurence of the gross abuses in land development which have prevailed in the past. ◄



Typical street cross sections showing dimensions and placement of curbs, pavements and walks.



a new program

for progressive improvement of secondary roads

This hard, firm unpaved road will eventually serve as a base for paving. Columbia Calcium Chloride keeps its surface stable, pays its way with reduced aggregate and blading costs.

QUESTION: How can you establish a stable, dustless surface for roads that merit it, when your yearly budget allows for paving on only a small portion of these roads?

ANSWER: A balanced program for roads utilizing the proved benefits and economy of Columbia Calcium Chloride for *Stage Construction and Improved Maintenance Standards.*

STAGE CONSTRUCTION PROGRAM consists of:

1. Improving width, alignment and drainage.
2. Placing the initial course of Columbia Calcium Chloride stabilized aggregate wearing surface. Columbia Calcium Chloride is used in this surface to hold fines moist and tie down stone. In some cases, traffic may use this surface for several years.
3. Adding the compact, dense-graded aggregate base course in sufficient thickness and gradation to support projected traffic. To insure uniform moisture for material stability, Columbia Calcium Chloride should be mixed with the base material or applied to the surface.
4. Paving as funds become available *in the future.* Usually little additional base work need be done. The base is stable with good grade which helps insure a successful paving job.

IMPROVED MAINTENANCE STANDARDS include:

1. The elimination of dust as a hazard, waste and inconvenience.
2. The ability to keep more roads well graded.
3. Future paved surface will be better because of more stable base. The use of Columbia Calcium Chloride is the soundest procedure for meeting the basic needs of a progressive improvement program.

Get complete information about a balanced program of secondary road improvement and how Columbia Calcium Chloride benefits both the road official and the road user. Write today for your free copy of this illustrated bulletin.

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DISTRICT OFFICES: Boston · Charlotte · Chicago · Cincinnati · Cleveland
Dallas · Houston · Minneapolis · New Orleans · New York · Philadelphia
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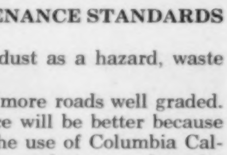
Columbia Calcium
Chloride
One Gateway Center
Pittsburgh 22, Pa.

Please send me a copy of "A Program for PROGRESSIVE IMPROVEMENT of Secondary Roads."



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Organization ____________________
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ON-THE SPOT DRILLING POWER

. . . with

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COBRA !

World's lightest motor drill!

Here's a drill you use to fill in on those jobs where cost, terrain, or time prohibits sending out a compressor crew. Weighs just 53 pounds; easily carried by one man. Completely self-contained with gasoline engine that drills 50-60 feet of hole on a tankload (2 qts.) of fuel. Drills in any position up to 45°. Perfect for light drilling anywhere. Write for complete literature. Address: Dept. AC-7

- **One-man operation!**
- **One-man carry; piggyback rig available!**
- **Easy starting—any weather, any altitude!**
- **Multi-use flexibility!**
- **POWERFUL—26 or more feet per hole per hour in hardest granite!**

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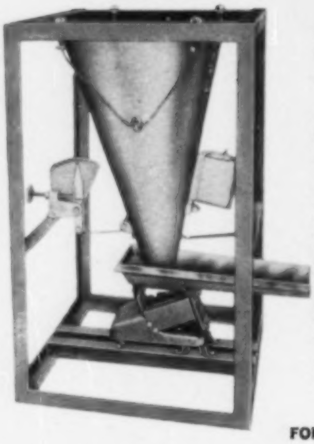
Volumetric feeding of dry bulk materials

SYNTRON VIBRA-FLOW

DRY FEEDER MACHINES



provide constant volume flow in the treatment of water and sewage disposal.

—handle all types of dry materials ranging from the fine amorphous types to coarse lumps.

Syntron Dry Feeder Machines flow material by vibration. The flow rate is rheostat controlled, easily adjustable to deliver amount of material desired in the treatment of water, sewage disposal and industrial processing. The electromagnetic drive unit assures low cost operation, long service life, and low maintenance.

Available in open or cabinet models in sizes and capacities for every need.

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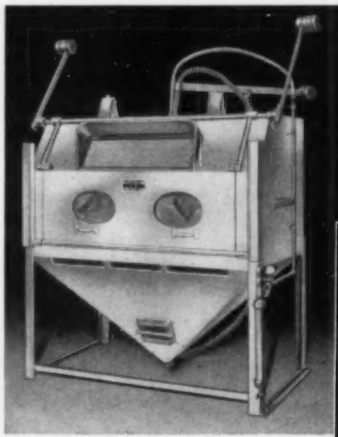
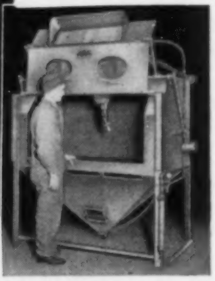
61WF2

SYNTRON **SYNTRON COMPANY**
430 Lexington Avenue • Homer City, Pa.

BLAST CLEAN WATER METERS

For Speed and Thoroughness!





RUEMELIN BLAST CABINETS effectively clean water meters, valves and pipe fittings, removing all foreign matter very rapidly. Built in several sizes. Units available with rotary tables.

Write for Bulletin 32-C and price data.

RUEMELIN MANUFACTURING CO.
3902 N. PALMER ST. • MILWAUKEE 12, WIS., U. S. A.
Manufacturers and Engineers SAND BLAST AND DUST COLLECTING EQUIPMENT, WELDING FUME COLLECTORS

The six diatomaceous earth filters, supplied by the R. P. Adams Co. of Buffalo, N. Y., for this compact installation, take over whenever Hudson's single slow sand filter produces poor results or is down for maintenance.

Hudson, N. Y., utilizes slow sand and diatomaceous earth filtration to obtain . . .

Clear Water Under All Conditions

By **HOWARD HARDING**
Supt. of Public Works

For more than 60 years Hudson has obtained its water from an 80-million-gallon creek-fed reservoir located about seven miles from the city. It flows by gravity through a single 23,000-square-foot slow sand filter into clear wells and thence, by gravity, into the distribution system.

Filter maintenance consisted of scraping the sand about two or three times each year, an operation requiring a week or ten days each time. During this period the city used unfiltered water. This in itself was not desirable, but to complicate matters, the filter bed needed a complete overhauling—a nine-month job. This necessitated standby capacity.

We considered two methods for providing this auxiliary capacity: conventional pre-treatment plus rapid sand filtration, or diatomite filtration. Since installed cost of the latter amounted to only a fraction of the sand installation, we chose this type for our standby plant.

Cost

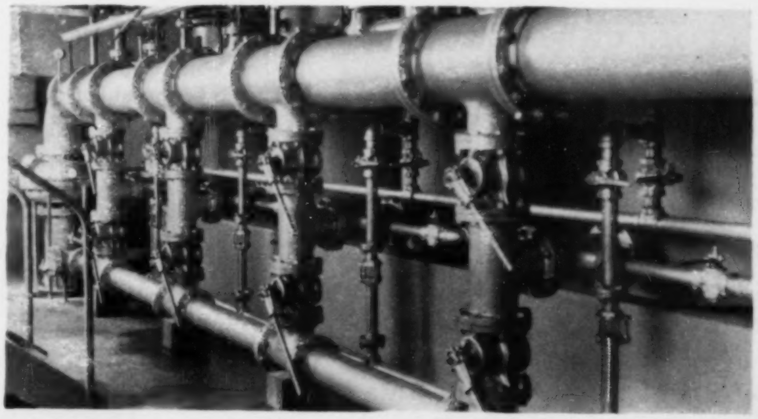
The new plant, designed by the writer and furnished and installed by Schultz-Forster Associates, Inc., of Troy, N. Y., cost approximately $65,000 or about $48 per square foot. It consists of six 238-square-foot Adams Poro-Stone filters capable of averaging (together) 2 mgd or one gallon per minute per square foot of filter area. The plant is compact, attractive and easily maintained. Operating cost, including depreciation, interest, labor, power, filter aid and other expenses, averages between three and four cents per 1,000 gallons to date.

A Worthington 1500-gpm, 60-foot-head pump driven by a 30-hp motor supplies the raw water, taking suction from the gravity feed line to the slow sand filter. A small Syntron feeder supplies diatomaceous earth to a solution pot, and the resulting slurry is fed into the pump suction by means of a hydraulic ejector.

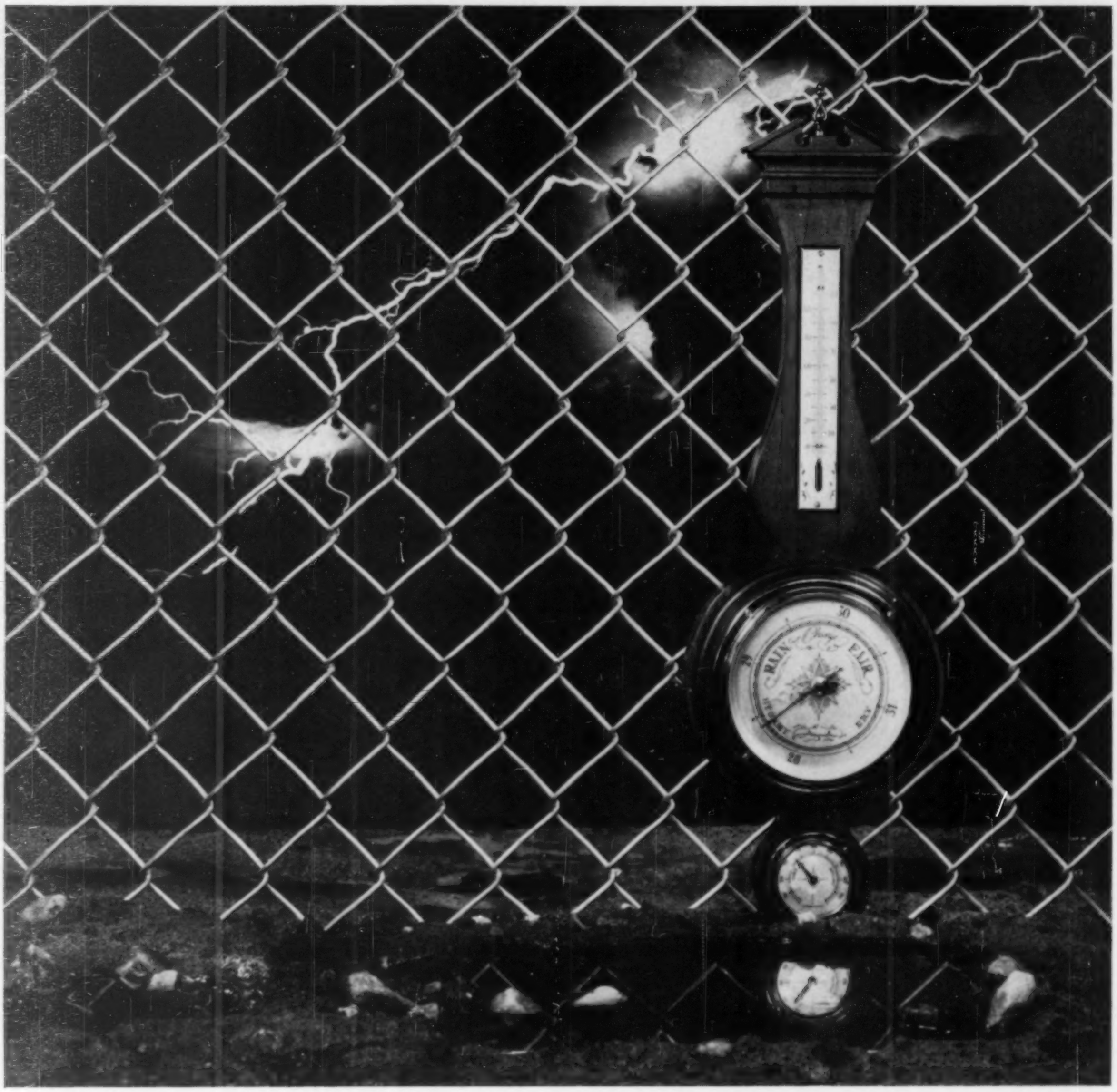
Feeding the body-feed slurry into the suction of the pump insures even distribution. This does result in impeller wear, but we figure on replacing the impeller about every six months and consider this as an operating expense.

We pre-coat the filters, one at a time, with Johns-Manville (Celite Division) Hyflo diatomaceous earth and continuously add filter aid by

(Continued on page 171)



These two clearwells can be fed by either the slow sand filter (upper right) or the new diatomite filter plant housed in the building at the left.



FORECAST: VIOLENT STORMS...BUT

Realock Fence will resist the foulest weather

That's because Realock is made from top grade steel wire, and is completely galvanized, making every foot thoroughly resistant to weather and corrosion. Realock Fence is a one-time investment that requires minimum maintenance.

Consider Realock Fence when you want the ultimate in protection. For complete information and a free estimate, contact the nearest CF&I office.

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Realock
Fence
CF&I
STEEL
MADE IN U.S.A.

The Colorado Fuel and Iron Corporation
Denver • Oakland • New York
Sales Offices in All Key Cities

(Continued from page 169)

means of a dry feeder. Filter cycles normally run 24 hours, using 150 pounds per day of Hyflo for precoating and 200 pounds per day of Celite 545 as body feed. This results in an excellent filtered water.

A second pump, rated at 150 gpm at 150-foot head, is used for back washing, slurry feed and supply to the chlorinator. This unit pumps filtered water only. We generally limit the back pressure on the filter elements to about 25 psi. Pressure in the raw-water header may exceed this.

Backwashing is also performed one filter at a time. After venting and draining the unit, the operator closes the discharge valve and allows filtered water to enter. This water compresses the atmospheric air into the pressure dome. At 50 to 60 psi this compressed air develops the high reverse water velocities necessary to purge the filter elements completely of cake. Cleaning and precoating requires about ten minutes for each filter. We chlorinate the finished water by means of a Fischer & Porter chlorinator.

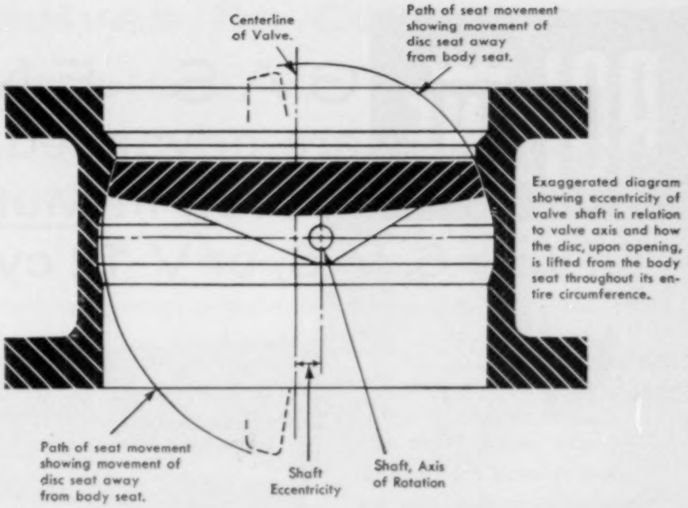
Frequent Use

Although constructed as a standby facility we use the diatomite filter plant more frequently than the term implies. The sand filter still serves as our primary unit, for its operating cost is very little. However, whenever performance of the sand filter is not satisfactory, a condition that may result from turbidity, algae or suspended coloring matter, we switch over to the new plant.

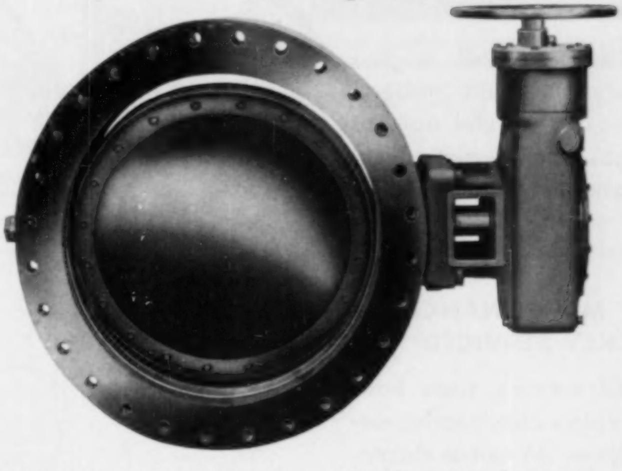
For example, last May, with only a few hours notice, we placed the plant into operation at full 2-mgd capacity. It immediately produced top-quality water superior to that of the sand filter. The unit will be used rather extensively during periods of high runoff when turbidity becomes a problem. ◄◄

Radio Network

A two-way mobile radio network, incorporating a "Quik-Call" Selective Signaling system is being installed by Motorola for the city of Detroit. Quik-Call enables individual calling of drivers. It can blow the horn, flash a light or cut in the red beacon to alert drivers who are away from their vehicles. The new system includes one 250-watt base station and 60 Motorola "T-Power" Radios.


Centerline of Valve.
Path of seat movement showing movement of disc seat away from body seat.
Exaggerated diagram showing eccentricity of valve shaft in relation to valve axis and how the disc, upon opening, is lifted from the body seat throughout its entire circumference.
Path of seat movement showing movement of disc seat away from body seat.
Shaft Eccentricity
Shaft, Axis of Rotation

HOW DARLING-PELTON BUTTERFLY VALVES lick common problems!



Problem No. 1—COMPLETE SHUTOFF. With a continuous, 360 degree, rubber sealing ring, uninterrupted by the valve shaft, *drop-tight* shutoff becomes possible!

Problem No. 2—SEAT LIFE. With the valve disc swinging on an axis eccentric to the valve centerline, the disc lifts away from the body seat upon opening—abrasion and distortion are avoided. Moreover seat life is further prolonged by easy, compensative adjustment.

Problem No. 3—MAINTENANCE. Maintenance is minimized and simplified due to the unique seat ring principle. No sealing problem around the shaft. The rubber seat is replaceable in or out of the line without dismantling the valve!

Get *all* the facts on performance and sizes. Made to A.W.W.A. Specifications. Send for Bulletin 5904.

DARLING VALVES

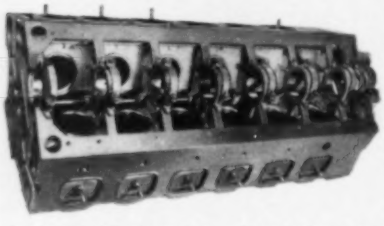
DARLING VALVE & MANUFACTURING CO.
Williamsport 10, Pa.
Manufactured in Canada by
The Canada Valve & Hydrant Co., Ltd., Brantford, Ont.

ROILINE GAS ENGINES are advanced, dependable, and proven in Municipal Service.

In-line 6, V-8, or V-12 cyls.—up to 706 hp.

HEAVY DUTY... LONG LIFE

A look inside these engines reveals the rugged construction that can be relied upon for dependable service.

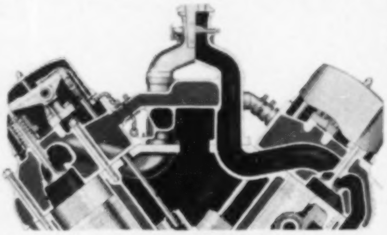


Internally ribbed crankcase gives solid crankshaft support. Extra rear main bearing absorbs side thrust.

Large diameter, short in length, the rugged counterbalanced crankshaft handles power without vibration. It has generous bearing areas.

MORE POWER... BETTER ECONOMY

These ROILINE engines are the most modern, most powerful natural gas-butane-gasoline engines in their class.

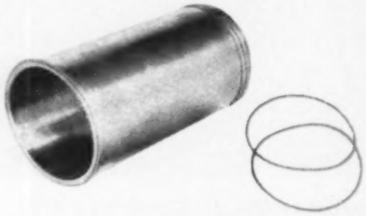


The "Easy Flow" manifold design provides perfect fuel and air distribution to all cylinders through large individual intake ports.

Aluminum pistons are taper cam ground. Full floating piston pins. Connecting rods have big wear-resisting replaceable bearings.

EASY MAINTENANCE... QUICKLY SERVICED

All wearing parts have replaceable bearing surfaces. *All* routine maintenance points are readily accessible.



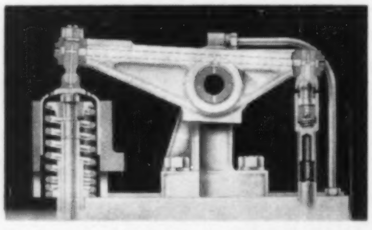
Long wearing cylinder sleeves are easily replaced and cost far less than reboring cylinder block and installing oversize parts.

Cylinder heads can be removed by one man without disturbing manifold, carburetor, or controls. Note guided valve mechanism.

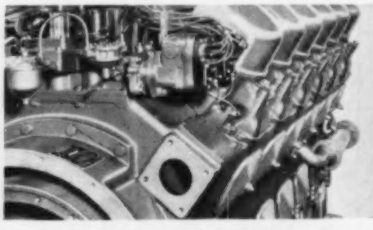
SMOOTH—QUIET... CLEAN—COOL

Benefits from newest design features mean more comfortable operating conditions and easier maintenance.

499 *Write for literature*



Hydraulic "Zero-Lash" lifters eliminate noise and adjustments and extend valve life. Engines are practically vibration-free.



Exhaust manifold is water cooled and integrally cast into the crankcase to provide cooler operating area and fast warm-up of the engine.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN / **New York • Tulsa • Los Angeles**
Factories: Waukesha, Wisconsin and Clinton, Iowa

Golden Colo., Solves Its Color and Turbidity Problem

. . . and increases overall plant efficiency at the same time

By **W. H. FLETCHER***

Color and turbidity were the chief water-supply problems of Golden, Colo. This city of 8,500 population, located 12 miles west of Denver, uses Clear Creek as its primary water supply, with Longs Lake and Beaver Brook available as a supplemental supply.

Rising high in the Rocky Mountains, Clear Creek has a drainage area of some 600 square miles, with over 50% located in the rugged mining areas above Golden. The water receives some pollution from mine drainage and ore-processing operations. Falling 115 feet per mile above the water plant, the chemical characteristics of the water change quickly and vary over a wide range, making efficient removal of mud, silt, color and suspended contaminants by clarification a continuous and difficult problem.

In 1951 the city installed a Walker Process Type S upflow clarifier of 2-mgd capacity to provide its citizens with better water. Water from Clear Creek is piped to a settling pond and then pumped to the clarifier by two 750-gpm Johnston pumps. Following clarification, the water passes through one of four carborundum - bottom, rapid - sand filters to a clear well. From here two 750-gpm Allis-Chalmers pumps deliver the water to the distribution system.

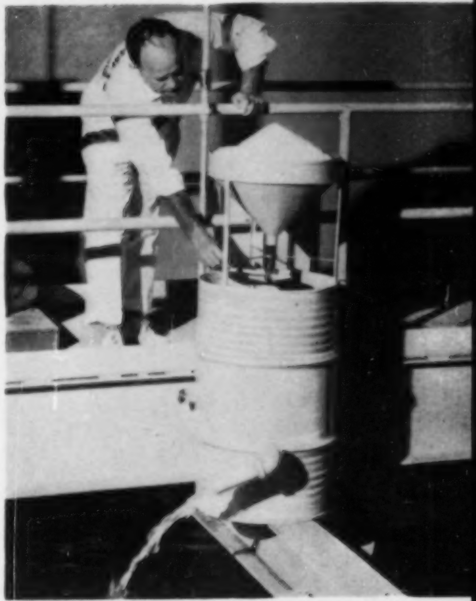
Turbidity Reduced

Actual operations showed lime and alum to be the best materials for coagulation, but turbidities of 20 ppm on top of the filters were not uncommon. The resultant short filter runs made efficient and economical operation impossible.

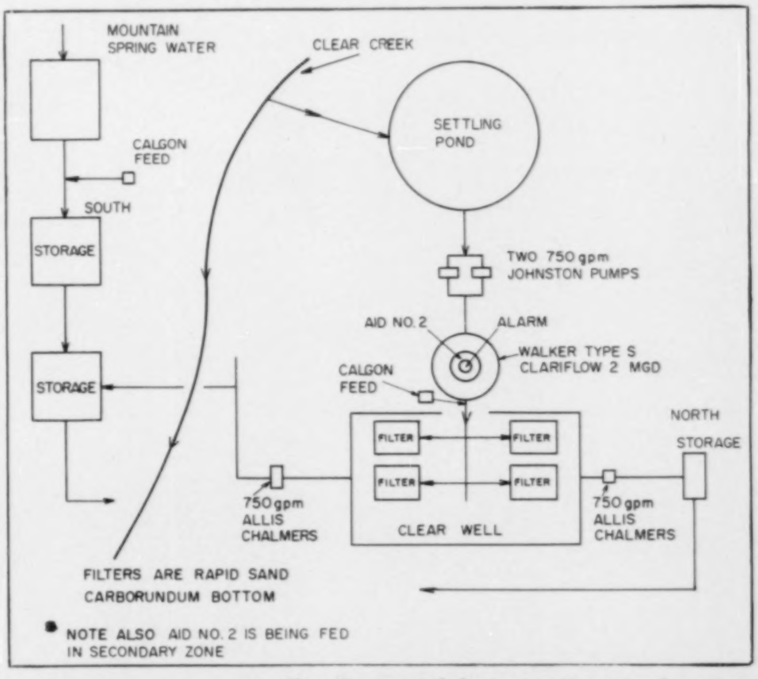
With the advent of coagulation aids approved for use in drinking water clarification, we decided to investigate thoroughly all available materials. This we did, using the jar test to narrow the field of available coagulant aids to two or three that showed promise on Clear Creek water. From these we hoped to find a material that would stabilize the sludge blanket and give a better water on top of the filters.

Between July and November of 1959 the tests had eliminated all but Hagan Coagulant Aid No. 2, a pure polyelectrolyte manufactured by Hagan Chemicals & Controls, Inc. In January 1960 we initiated plant trials using this material, with results almost exactly the same as obtained from the jar tests. Through

(Continued on page 177)



Author Fletcher adjusts the dry chemical feeder, designed and built by the Golden water plant operators, to feed the proper amount of coagulant aid.


MOUNTAIN SPRING WATER
CLEAR CREEK
SETTLING POND
CALGON FEED
SOUTH
STORAGE
STORAGE
TWO 750 gpm JOHNSTON PUMPS
AID NO. 2
ALARM
WALKER TYPE S CLARIFLOW 2 MGD
CALGON FEED
NORTH STORAGE
FILTER
FILTER
FILTER
FILTER
750 gpm ALLIS CHALMERS
CLEAR WELL
750 gpm ALLIS CHALMERS
FILTERS ARE RAPID SAND CARBORUNDUM BOTTOM
NOTE ALSO AID NO. 2 IS BEING FED IN SECONDARY ZONE

Flow diagrams of the treatment process for water received from Clear Creek and Beaver Brook.

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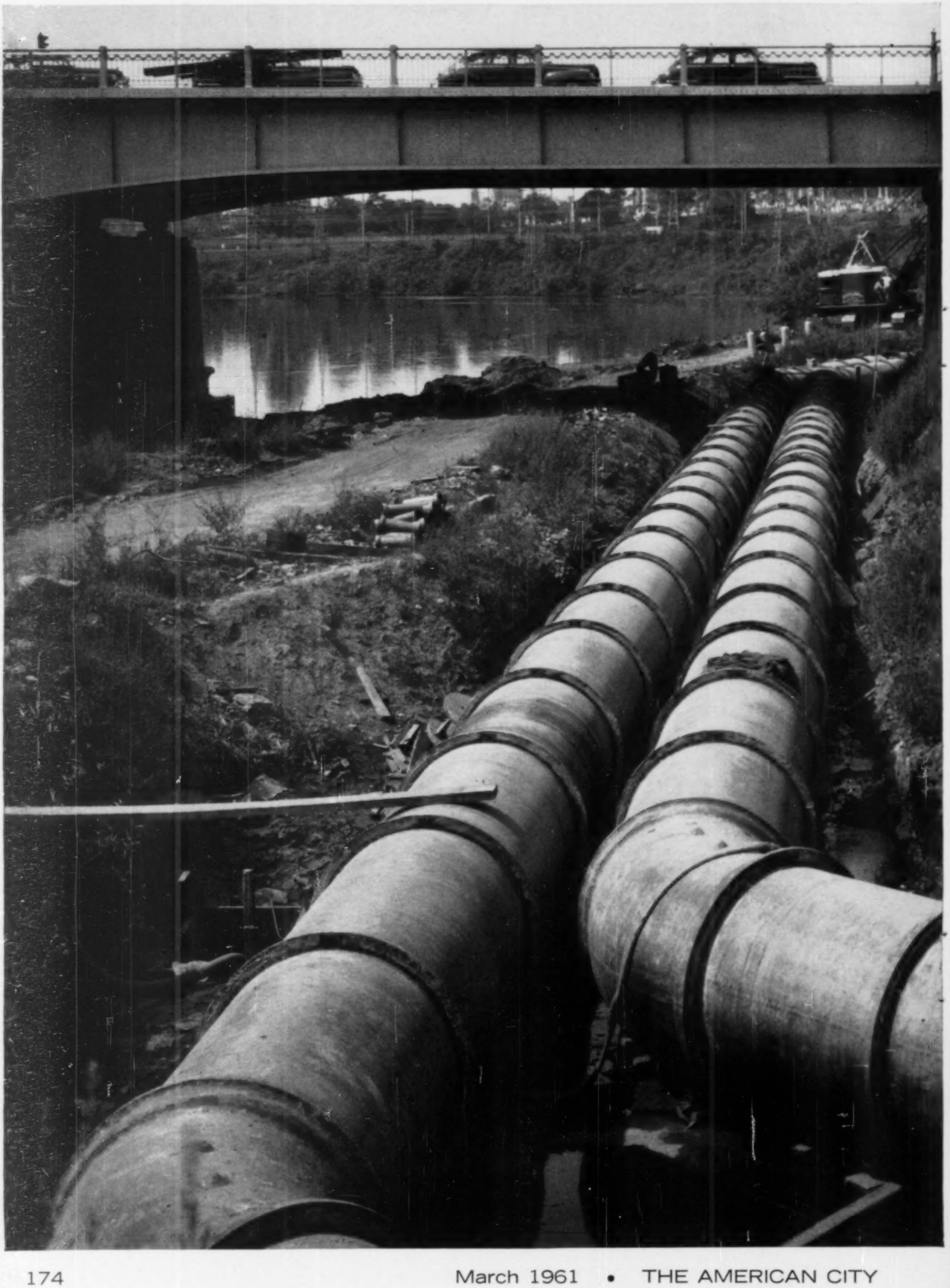
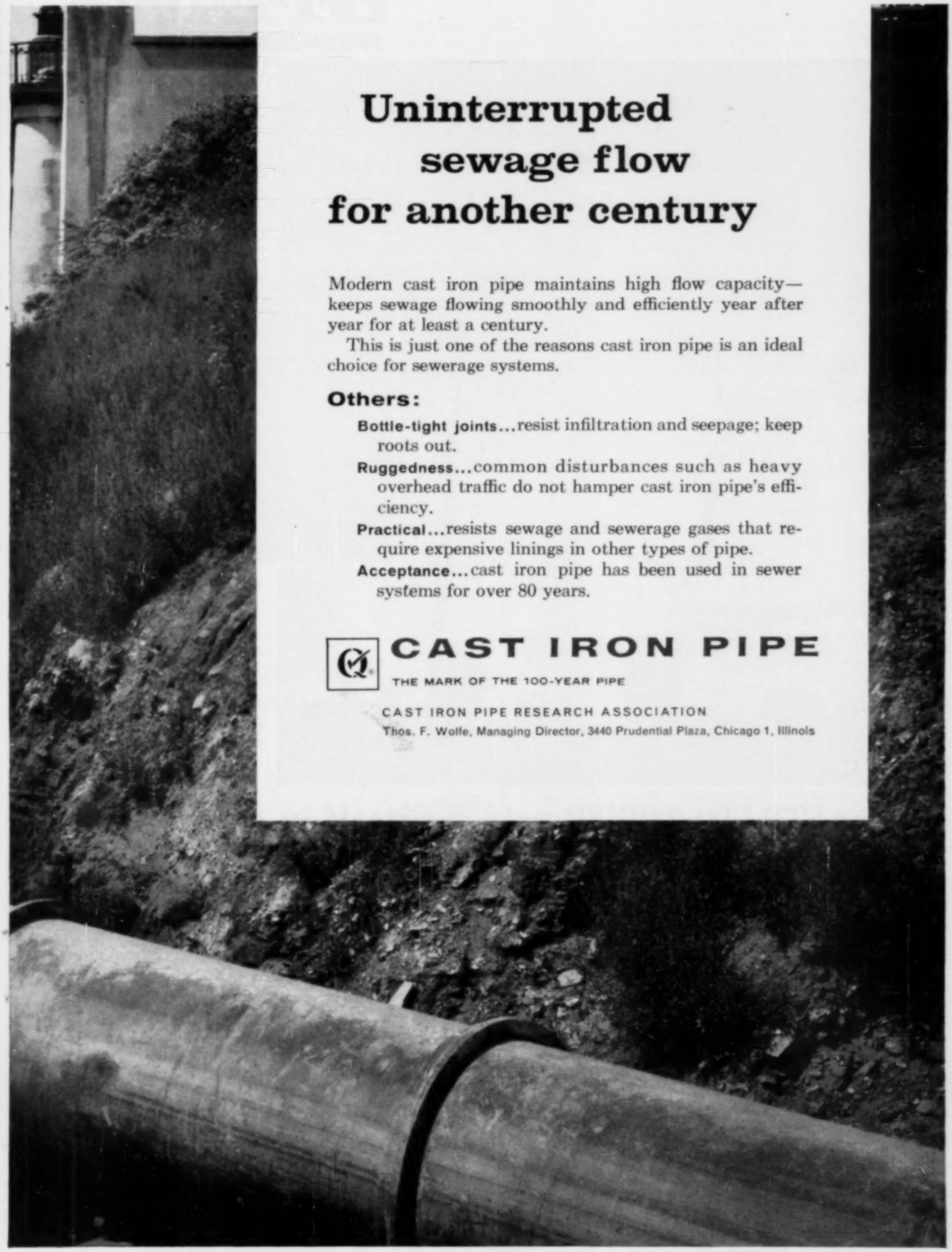
*Mr. Fletcher took over as chief water plant operator for Golden, Colorado, in April 1959, following 21 years of service with the U. S. Army Corp. of Engineers, of which 18 years were in the water-supply field.





Uninterrupted sewage flow for another century

Modern cast iron pipe maintains high flow capacity—keeps sewage flowing smoothly and efficiently year after year for at least a century.

This is just one of the reasons cast iron pipe is an ideal choice for sewerage systems.

Others:

- **Bottle-tight joints...**resist infiltration and seepage; keep roots out.
- **Ruggedness...**common disturbances such as heavy overhead traffic do not hamper cast iron pipe's efficiency.
- **Practical...**resists sewage and sewerage gases that require expensive linings in other types of pipe.
- **Acceptance...**cast iron pipe has been used in sewer systems for over 80 years.

CAST IRON PIPE
THE MARK OF THE 100-YEAR PIPE

CAST IRON PIPE RESEARCH ASSOCIATION
Thos. F. Wolfe, Managing Director, 3440 Prudential Plaza, Chicago 1, Illinois

OTTAWA
STRATO-TOWER

STRATO-TOWER

For trimming around wires, Marshfield crews find their 45′ Strato-Tower reudces tree mutilation, eliminates ladders, cuts accidents and does the job quicker—yet saves taxpayers over $3000 a year in time and labor.

"Our STRATO-TOWER paid for itself in six months IN SAVINGS ALONE"

... reports Marshfield, Wisconsin utility

"After we charge off everything on this machine, the taxpayers are more than $3000 better off each year because we've got an Ottawa Strato-Tower," says an official of the Marshfield (Wis.) Electric and Water Department. "We use it for trimming trees, hot-line clamps, stringing wire, street lamp maintenance, transformer installation, Christmas decorations ... anything. In fact, we couldn't do without it."

For most *any* high job you have, an Ottawa Strato-Tower will do the work faster, cheaper and safer. Its unique single-lever control lets the man in the basket raise himself to the best, most efficient working position ... puts him in hard-to-reach places to get the "impossible" jobs done quickly. And, Strato-Tower is safe ... has *6 to 1* structural safety factor. Fiberglas buckets and booms isolate crews from high voltage—insulated booms protect on low voltage. Hydraulic outriggers level the truck during operations. With working heights from 35′ to 109′, there's a Strato-Tower to reach your exact requirements.

See what the Strato-Tower offers you in speed, safety and economy. Like Marshfield Electric and Water Department, you'll be enthusiastic. Your Ottawa Distributor can give you the full details, or write today to **Equipment Division, Young Spring & Wire Corporation, Bowling Green, Ohio.**

YOUNG
SPRING & WIRE CORPORATION

EQUIPMENT DIVISION
YOUNG SPRING & WIRE CORPORATION
MANUFACTURERS OF
DAYBROOK TRUCK EQUIPMENT **OTTAWA** CONSTRUCTION EQUIPMENT

(Continued from page 173)

the addition of Hagan Coagulant Aid No. 2 we were able to reduce turbidity on the filters to 3 ppm with zero turbidity recorded after filtration.

This made possible increased plant production from 1.5 mgd to 2.2 mgd, resulting in an increase in overall plant efficiency. Since the coagulant aid appears effective over a wide pH range, treatment adjustments are rarely necessary.

Color Removed

Having solved the clarification problem which plagued the city for nine years, we turned our full attention to a black and red water problem in the distribution system. Our raw water has an iron content of 1.65 ppm and contains 1.0 ppm of manganese.

Excellent clarification at a pH of 7.4 has reduced the iron content to less than 0.1 ppm, but it is not economically feasible to reduce the manganese sufficiently by clarification.

To solve the manganese problem, we initiated the feeding of Calgon (sodium hexametaphosphate) at the rate of 1.8 ppm to stabilize the manganese in the water, thereby preventing precipitation in the distribution system. This treatment applied at the plant and at Beaver Brook ended consumer complaints due to colored water.

Thus, with the combination of our treatment facilities and coagulant aids, we now provide the citizens of Golden with an abundant supply of clean, clear water at an economical cost.

Cities, Generators Of Civilization

Cities are not merely the vessels but the actual generators of civilization. They are not obsolete as many exponents of current thought say.

So argues Professor James M. Fitch, Columbia University School of Architecture, in the Columbia University Forum.

It is not all accidental that such words and concepts as civil, civilized, citizen, urbane, and urbanity cluster around the word and concept "city," he states.

Urban experience is their point of origin. The city always has been the lodestar of farmer, herdsmen, hunter, sailor. It offered them steady employment and the food, clothing and shelter that were statistically so chancy elsewhere. It offered them paved streets, lighted taverns, buzzing markets, instead of barnyard mud or storm-tossed ocean nights. It promised them music, dancing, theater and spectacle. Even more precious it gave them relative safety from war and sanctuary and asylum for dissent.

Professor Fitch concedes that the mechanization of American life in all its major aspects has almost equalized the historic disparity between the material conditions of urban and rural life. As a result, there has been a blurring of the physical and cultural distinctions between the city and countryside and the birth of a whole set of misconceptions; and, for the first time in western history, it is seriously being argued that the city itself is no longer able to live.

Professor Fitch agrees that the great cities of the world may be too large to function effectively and that the future may see a planned reduction in their size. But this is a far different thing from declaring them "obsolete" and rejoicing in their dissolution. ◄◄

THESE A-C DIESEL ELECTRIC SETS GIVE YOU

A NEW KIND OF DIESEL
AND BRUSHLESS GENERATORS

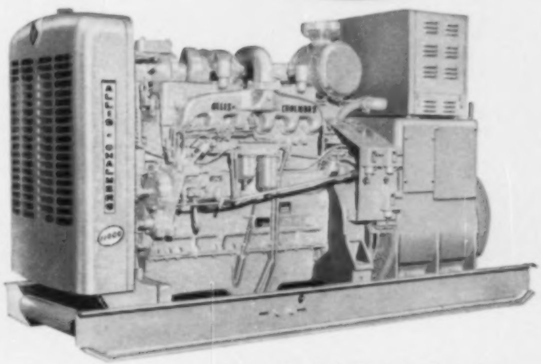
WORK POWER

21000
200 kw

16000
130 kw

11000
110 kw

10000
66 kw



Easy to Install — Quick to Start — Self-contained, unit-type sets are mounted on skids. No need for special foundations . . . no danger of misalignment. Allis-Chalmers diesels "kick over" instantly — take as little as four seconds to start and pick up the load.

Diesel Safe — Economical, Too — Use safe diesel fuel. Allis-Chalmers controlled turbulence assures *complete* combustion . . . full utilization of fuel saves up to 27 percent over other diesel units in this size range.

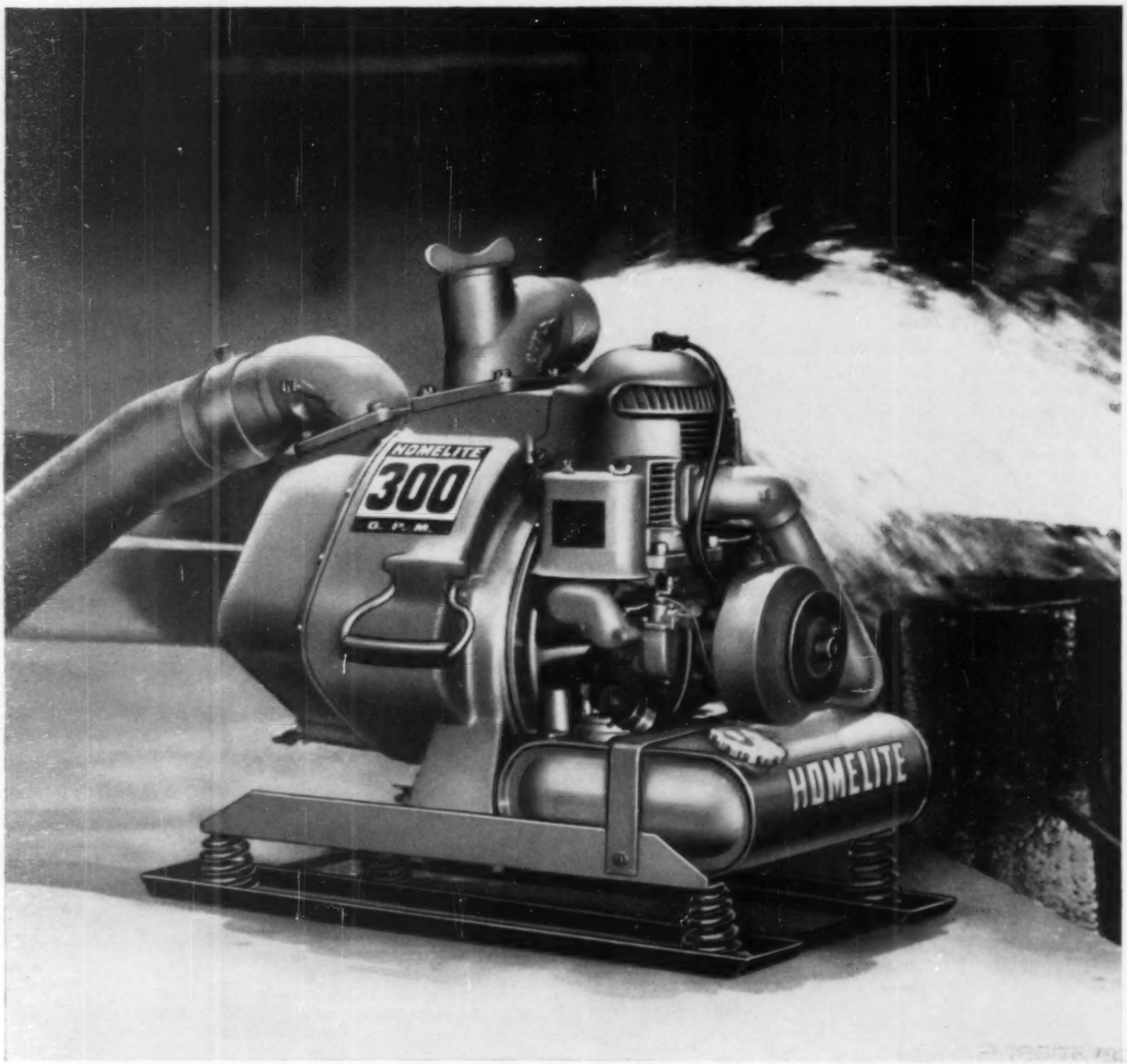
Modern Brushless Generator and Magnetic Amplifier-Type Static Voltage Regulator

- Maintains fast, accurate and stable control of voltages.
- Picks up 50 percent heavier starting loads than possible with conventional machines.
- Avoids radio interference — no brushes.
- Provides broad range of voltages — to suit customer installation requirements.
- Easily serviced and maintained — no brushes, no slip rings, no moving contacts to burn or wear.

All major components — engine, regulator, generator and switchgear — are engineered, coordinated, built and *backed* by a single manufacturer. Let your Allis-Chalmers dealer give you the complete facts and specifications. For more information, write Allis-Chalmers, Milwaukee 1, Wis.

BG-43

ALLIS-CHALMERS
POWER FOR A GROWING WORLD



USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

The Pump That's Measured In Minutes

This pump is called the Homelite "300" Pump for a very good reason. In addition to fast self-priming, guaranteed 28 ft. suction lift, non-clogging design, and extra long life ceramic coated seal, this pump handles 300 gallons per minute . . . 18000 gallons per hour. It does the job in minutes. And, it gets to the job in minutes. It's compact, lightweight and can be carried easily to any pumping location.

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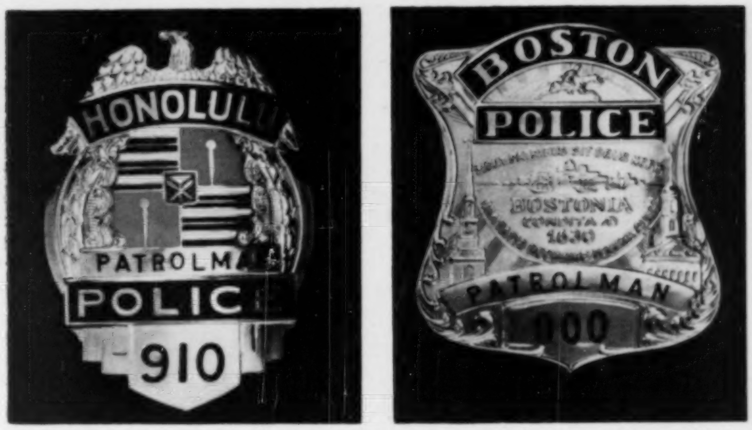

The Honolulu badge (left) and the Boston badge (right) were custom made by V. H. Blackinton & Co., Attleboro, Mass.

Take Boston, for example. The official police badge there had not been changed for thirty-eight years. It was a good solid badge, like those of thousands of other police departments. Though undistinguished, somebody must have liked it because when Police Commissioner Leo J. Sullivan took office in 1958, at least thirty-five badges were missing—and could very well be in mischievous or dangerous hands. So—Boston has a new badge, larger, of distinctive shape, with a snappy blue enamel inlay, and the city seal. The old badges have been recalled and the missing thirty-five are just ornaments now.

Similar tales can be told for Honolulu, Mobile, Pensacola, and in scores of other cities across the nation, whose police wear custom-designed badges. It is a quiet, colorful revolution in service badges that has actually been going on for some time.

A surprising feature of the trend is the enthusiasm and ability displayed by police and fire officials themselves in supplying designs. The manufacturers, of course, have their own designing staffs that supply free sketches of proposed badges. But men like Sheriff Ray D. Bridges of Mobile and Police Chief Dan Liu of Honolulu frequently give the professional draftsmen a big assist.

The Honolulu badge, for instance, utilizes the coat-of-arms of the old Kingdom of Hawaii as its central motif. No less than six colors of enamel were used to capture the pageantry of symbolic figures that appear in the venerable Hawaiian armorial bearings.

Police-Fire Integration

A report, prepared by the Governmental Research Bureau of Buffalo and Erie Co., Inc., Lackawanna, New York, office for the Lackawanna Police Commissioners, summarizes police-fire integration in cities with populations of 25,000 or more.* These public safety organizations are categorized as complete, partial or functional police-fire integration. Four Canadian cities and three United States cities reported as having complete police and fire integration are noted below.

East Kildonan, Manitoba, with a population of 25,000, operated separate police and fire departments until July 1, 1955; since then it has a Department of Public Safety under a Director of Public Safety. The personnel included are: one inspector, five sergeants, one detective, 27 constables and four clerks. Two patrol cars are manned by two men each; they patrol the city and respond to fire calls along with the fire apparatus. C. N. Suttie is Mayor.

Cap-de-la-Madeleine, Quebec, with a population of 26,500, has 29 police and firemen, all except for

(Continued on page 180)

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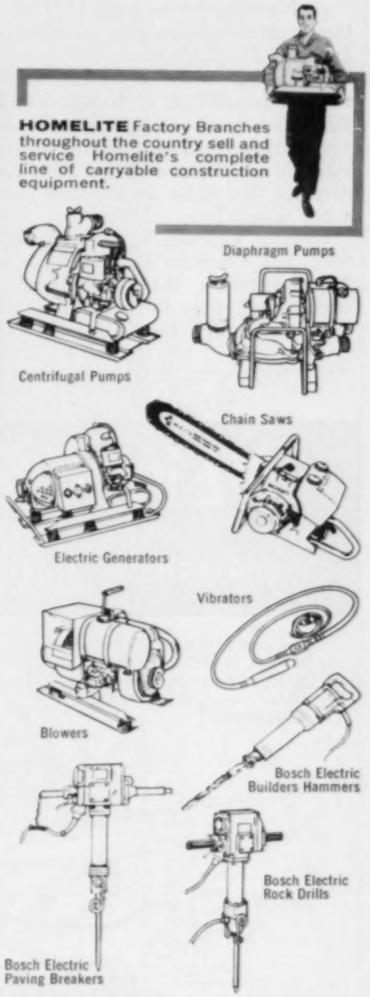
* This summary was compiled in connection with the Bureau's recommendation that the City of Lackawanna study the possibility of integrating their police and fire departments. Copies are available from the Bureau for 25 cents to cover postage and handling.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WEST: CALIFORNIA: Fresno, Los Angeles (Alhambra), Sacramento, San Francisco • COLORADO: Denver • OREGON: Portland • UTAH: Salt Lake City • WASHINGTON: Seattle, Spokane

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(Continued from page 179)

two detectives, directly under Police Director H. R. Lachance.

Salaberry-de-Valleyfield, Quebec, with a population of 30,000, has a minimum crew at the police and fire station which is on duty to answer fire calls, and patrol cars are directed by radio to the fire sites when needed.

Granby, Quebec, (population 30,000), has a regular force of 32 men. In addition to the regular police department, they have an auxiliary department of 18 men in constant training and available at all times for any calls. All the men on the force are hired as policemen and get weekly training as firemen.

Oak Park, Mich. (population 31,000), has a Department of Public Safety consisting of the following divisions (with their superior officers appearing in parenthesis): Fire Bureau (Marshal), Detective Bureau (Sergeant), Uniformed Division (Lieutenant), Juvenile Bureau (Officer), Patrol Bureau (Sergeant), and Records Bureau (Officer).

Special considerations are: The city has no slums, no high buildings, no congested areas, and no bars. Glenford S. Leonard is Director of Public Safety.

Sunnyvale, Calif. (population 55,000), has a Chief (J. Jessup) of the Department of Public Safety; the Chief of Police and the Fire Chief were made captains. All employees of the police and fire departments became public safety officers instead of policemen and firemen. The city is patrolled by mobile units manned by public safety officers. Although the city's population has increased five fold since integration in 1950, the city administrators feel that the consolidated departments are far superior to traditional police-fire protective methods.

Winston-Salem, N. C., has a population of 108,000. A fire company of 14 men was organized with six regular firemen and eight members of the Fire-Police Patrol. This integrated patrol covers only the northwest area of the city. The regular firemen in this section act as apparatus drivers. All personnel come from the ranks of the Fire Department and have also been trained in police work. This plan involves only part of the city and a population of 20,000, but it has been found that these citizens are receiving better fire and police protection at a savings in excess of $20,000 annually. Studies are being made to determine the feasibility of extending this system into other areas of the city. John M. Gold is the city manager. ◄◄

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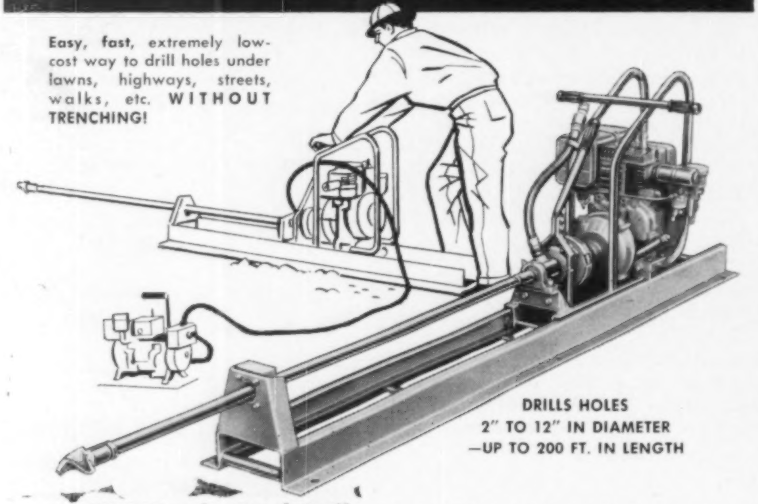

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Life would be simpler and more pleasant if growth in the demand for water followed a good, rational textbook formula. But city administrators and planners have no such simple aid. Their problems are pointed up sharply by Edward Nave, Tennessee Division of Water Resources for State Planning Commission. Five cities in this state, representative of both large and small municipalities, have increased their demands for water in amounts that vary from 300% to 480% over the last two decades. The five cities are:

City	Present Water Use	Increase over 1940
Memphis	**60.0 mgd**	**300%**
Alcoa	**5.2 mgd**	**300%**
Kingsport	**4.6 mgd**	**340%**
Cookeville	**1.0 mgd**	**360%**
Columbia	**3.6 mgd**	**480%**

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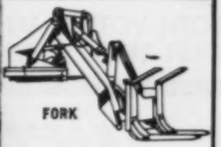

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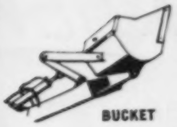
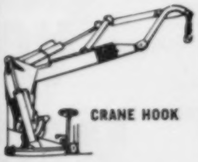
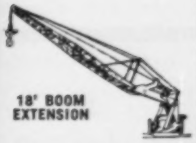


BUCKET



CRANE HOOK



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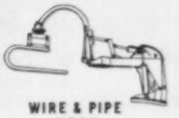
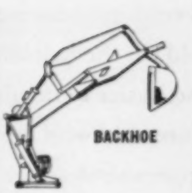
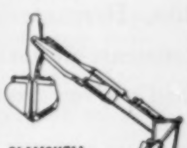


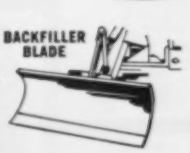
WIRE & PIPE HOOK



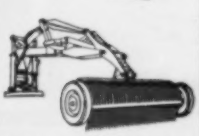
BACKHOE



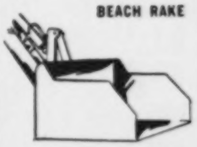
CLAMSHELL



BACKFILLER BLADE



BEACH RAKE



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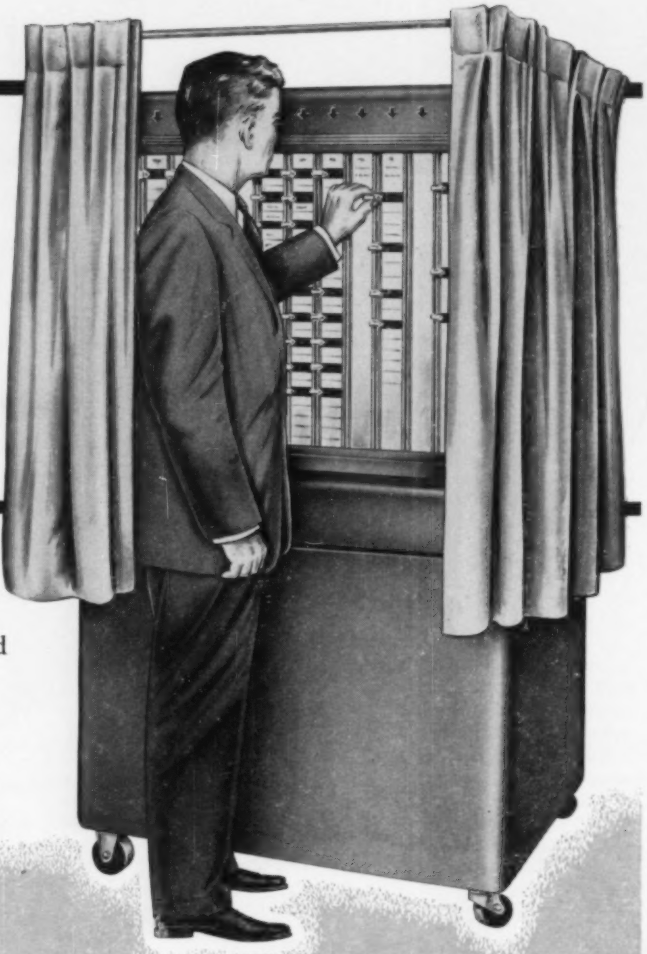

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"I am acquainted with all types of voting machines now being used and am convinced this is the best."
. . . *voter*

◆

"Voting machines are essential today. This is the best one I've seen. Surely we'll be allowed to have them soon."
. . . *voter*

"Simple and uncomplicated — I like it."
. . . *voter*

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"I have voted on machines in Pennsylvania and Indiana. This machine is much simpler, more compact and looks a lot nicer. It should pay for itself in a short time."
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"My chief concern was maintaining the secrecy of the ballot. You have protected that."
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Capital Improvements In New Subdivisions

By **FRANK U. KOEHLER**
Director of Finance
City of Highland Park, Ill.

A major problem facing a community is providing adequate public services to newly developed areas. These must include police and fire protection as well as to provide the fundamental improvements necessary before other services can be provided.

There are at least three types of subdivision. One is like Park Forest, Ill.; Elk Grove, Ill.; or Levittown, Pa.—communities completely developed where once there was nothing. The second is characterized by the fact that the subdivider is not a developer but sells the individual lots to others who will build their own homes. The third type of subdivision, one which has created the most problems in Highland Park, is the resubdivision of a lot or estate which is larger than required by the zoning ordinance.

Responsibility

What then is the obligation upon the city to ensure that public improvements are provided? What is the responsibility of the developer to those who will settle in this subdivision?

The legislative and administrative agencies of any community in which development is taking place are faced with moral and political responsibilities to the present population as well as to future residents of new subdivisions. Adequate improvements should be required of the subdivider. Many apartment dwellers moving for the first time into their own homes are not trained or experienced in determining what public improvements ought to be provided. These facilities are frequently taken for granted. Failure to require them may at some later date place an additional and unexpected burden on the homeowner and, probably, on the community through maintenance of inadequate improvements or through replacements.

For example, an inadequate improvement such as a gravel road could place a large maintenance burden on the city's budget. In recent years in Highland Park the maintenance cost of gravel roads has been as much as 40 times greater than the cost of maintaining concrete roads on a mile per mile basis. Replacement of these streets with an adequate pavement places a great burden on new homeowners who have often assumed enormous mortgages to buy their homes.

Highland Park is presently installing permanent pavement in a subdivision in which no improvements could be required by the city because of legal technicalities The only factor protecting the city's maintenance budget was a long standing policy dating back into the 1920's under which the city refused to maintain streets which were not built to city "standards." Although the city could not require this particular developer to construct streets to city standards the burden of maintaining these streets was rejected and placed primarily on the new homeowner. Sometime in the process of purchasing and moving into his new home, the refugee from the central city received the impression that in the relatively near future Highland Park would provide a permanent pavement without any additional cost to him. It has been a great shock to first find out that the city would not build such a street and, second, to contribute annually to help purchase gravel for the maintenance of his street.

The developer is as responsible for the provision of adequate improvements as the city. However, the subdivider who is only interested in a quick profit and then leaves the community does not feel the same pressures as one who develops a large tract or remains in a given region for a long time. One of the developers in Highland Park has been building here for five years. If some of the early improvements had been inadequate, not only would the city have increased its requirements, but the reputation of his developments would have quickly suffered.

In reviewing standards required in various communities in the United States and Canada, we found great divergence in the quantity

(Continued on page 185)

The complete paper was presented before the Municipal Finance Officers Association of the United States and Canada 54th Annual Conference in New York City, June 7, 1960.

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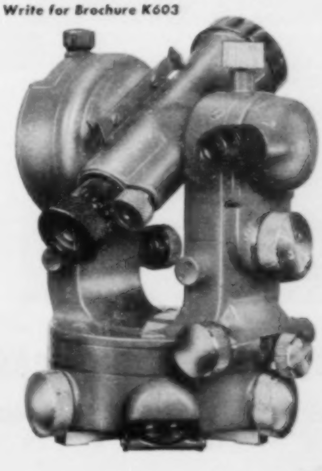

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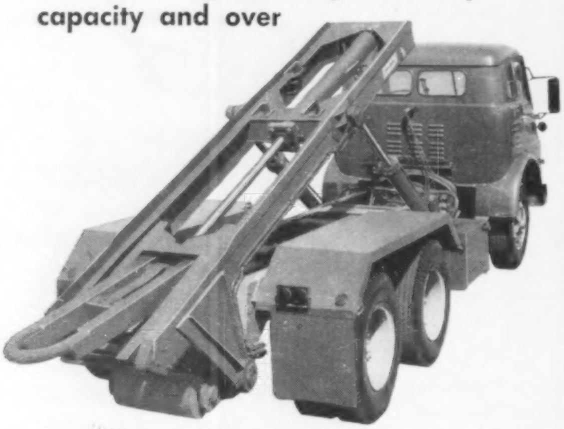

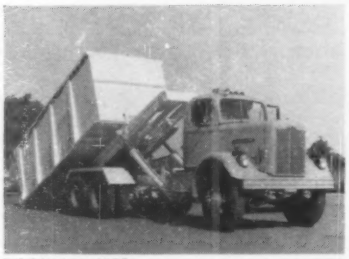

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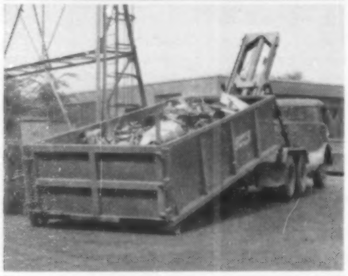

extremely heavy materials in smaller containers . . .

. . . and can even handle two containers at a time for additional flexibility.

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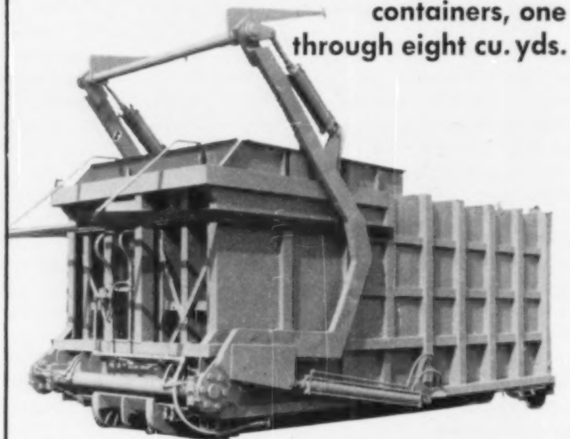

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(Continued from page 183)

and quality of improvements required of the subdivider. Highland Park ranks high. Our standards applied to subdivision developments of five or more lots are identical with the standards for any improvements installed by the city and include seven-inch reinforced-concrete pavements 28 feet or more in width, depending on the type of street, curbs, gutters, storm sewers, sanitary sewers, water mains, fire hydrants, and sidewalks.

Highland Park has experienced more problems in the administration of improvement regulations in small resubdivisions than in the subdivision of raw land.

The very size of the property tends to permit a contractor to install the entire sewer or water main in one day. On occasion contractors have attempted to complete such projects without notifying the city. In order to maintain closer control over the contractor, the city has encouraged the subdivider to place funds in escrow with the city in lieu of the usual performance bond. Under this arrangement, the city has achieved complete control of payments to the contractor and can delay any or all payments until the improvement meets city standards.

The Highland Park ordinance provides, as do others, that under certain circumstances exceptions may be granted from the requirements of the improvement ordinance. The exception for which most requests are made and which are most frequently granted is waiver of the requirement for sidewalks. Although cost is certainly a factor in the request for this waiver, the frequency of this request is an indication that the so-called "country atmosphere" is sought by many who move to suburbs.

Improvements are paid for by the subdivider, the operating funds of the city and special assessment. Most cities require the subdivider to finance most or all of the improvements in his subdivision. The cost is then included in the sale price of each house. The most common exception is for the municipality to finance that portion of the improvements which is required for other areas of the community.

In conclusion, it can be noted that the municipality, the developer and, to an increasing extent, the home buyer are becoming more and more conscious of the need to provide adequate improvements in each subdivision. ◄◄

Long Beach Will Study Compact Cars

Long Beach, Calif., recently awarded a contract for 24 Studebaker Larks, 1961 model. Of these, half will be equipped with automatic transmissions and half with conventional. Those with the automatic transmissions will cost the city $1725.53 each; those with the standard transmissions, $1590.25.

The purchase of the "compacts" with the automatic transmissions represents a savings of $363.83 each, according to City Manager Samuel E. Vickers. This is based on a direct comparison with purchases in 1959 of three "standard" cars with automatic transmissions and disregards general price adjustments of the intervening two years.

Mr. Vickers does not yet have operating data on the compact cars. However, the city purchased cars having both types of transmission to permit obtaining more conclusive evidence on the operating costs of the two types. ◄◄

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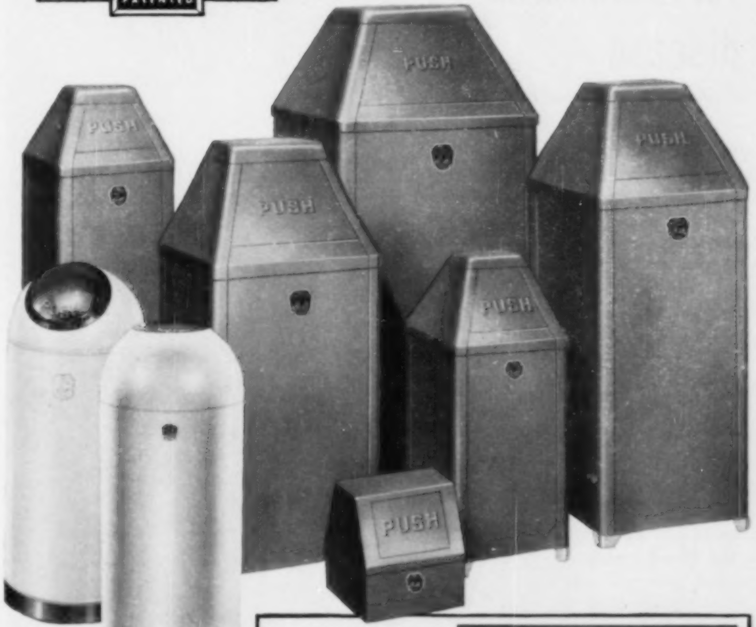

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ZONING AND PLANNING DECISIONS

Edited by NORMAN WILLIAMS, Jr.

Shopping Center—Regulation of the Maximum and Minimum Size of Stores—Off-Street Parking

NEW JERSEY. *Ridgeview Co.* v. *Board of Adjustment of the Borough of Florham Park,* 154 Atlantic (2d) 23 (Superior (lower) Court, July 30, 1959).

In this case a commercial district in the Florham Park zoning ordinance permitted shopping centers, with the maximum ground floor area for any individual store limited to 5,000 square feet, and the minimum floor area required to be at least 1,500 square feet. Coverage was limited to 20%, and accessory off-street parking was required at the ratio of 6 to 1. These provisions were challenged by a developer who proposed to build a shopping center with stores violating both the minimum and the maximum restrictions, and with insufficient parking to meet the requirement. The Court invalidated the challenged restrictions.

In an elaborate trial, the restrictions on the size of individual stores received support from some of a series of expert witnesses. The limitation on the maximum size of stores to 5,000 square feet was defended by the local authorities on the grounds that (a) large supermarkets would tend to draw in customers from adjacent municipalities, and (b) the town was entitled to limit the size of individual stores in order to prevent such establishments from thus creating traffic congestion. While there was some expert testimony to support this argument, the Court held that such a restriction was arbitrary and invalid. Restriction on the minimum size of stores was, quite rightly, given short shrift both by the expert witnesses and by the Court; and, in fact, not even the defendant borough had much to say in its favor. Both these regulations were referred to as "an attempt to control the location of partitions within such a conforming building."

The 6 to 1 parking ratio was also held invalid, on the ground that it seemed unnecessarily stiff. Apparently one reason was that, within a few years, the township has successively enacted parking ratios of 2 to 1, 4 to 1, and then 6 to 1.

Motel in Industrial District

NEW YORK. *Tornado Industries, Inc.* v. *Town Board of Oyster Bay,* 187 New York Supplement (2d) 794 (Supreme (lower) Court, June 26, 1959).

In this case a permit was refused for a motel in an industrial district. The Court reviewed the reasons alleged in support of such denial, and upheld the refusal on the grounds that—even though the Court itself might disagree on the merits—some reasonable basis had been given for the denial.

> "Here the Town Board listed reasons for the denial of petitioner's application. If I were sitting on that Board I might debate and, in my own mind, refute each one, because in a light industrial area I cannot perceive how a motel will deteriorate the value of the surrounding property. But here, the board says that squeezing a 24 or 25 unit motel in an irregularly shaped plot approximately 14 feet on one street, 169 feet on the rear line, 102 feet on a side line and 152 feet on Sunrise Highway, leaves insufficient area for off-street parking. This on the Sunrise Highway, a four-lane, heavily traveled thoroughfare, will create a traffic problem. This may be disputed but it cannot be said that the subject is not debatable. If it is debatable, I cannot substitute my judgment for the judgment of the board."

> "As I view it the control of traffic is a matter within the police power; it relates to the health and safety of the public. Its exercise in the determination of this application for a special exception under the zoning regulation here invoked is valid and proper."

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that it is a legitimate function of zoning to prevent traffic-generating establishments from locating where they would tie up traffic in nearby streets, is a welcome relief from some recent New York opinions—which have dismissed the basic importance of traffic-generation in zoning with meaningless rhetoric to the effect that the control of traffic is a matter for direct police regulation only.

Extension of Non-Conforming Use From Snack Bar to Beer Joint

NEW YORK. *Town of Onondaga* v. *Hubbell*, 188 New York Supplement (2d) 807 (Supreme (lower) Court, July 24, 1959).

In this case, a "snack bar" existed as a non-conforming use in a single-family residence district; and the proprietor obtained a license from the State Liquor Authority to sell beer, for consumption both on and off the premises. The town authorities moved to stop the sale of beer, as an unlawful extension of a non-conforming use. It was conceded that, after the sale of beer had started, the amount of business and traffic at the premises increased.

The opinion contained a strong statement on the desirability of eliminating non-conforming uses as soon as practicable. The Court held that the sale o beer involved "an increase in volume accompanied by a fundamental change in the non-conforming business use . . . a departure into a new and different area of business," and therefore that this was not entitled to legal protection, either as a continuation of a non-conforming use, or as the addition of another similar product. It was also held that enforcement of these zoning regulations did not encroach upon the State Liquor Authority's power to regulate the sale of intoxicating beverages. In short, it is now a matter of law in New York State that a short-order house is quite different from a beer joint.

Walden Pond—Enforcement of Restrictions on Its Further "Development"

MASSACHUSETTS. *Nickols v. Commissioners of Middlesex County*, 166 North Eastern (2d) 911 (Supreme Judicial (highest) Court, May 3, 1960).

In 1922, pursuant to statutory authorization, the State of Massachusetts acquired land along the edge of Walden Pond and the nearby woodlands; and the terms of the grant provided explicitly that "the sole and exclusive purpose of this conveyance" was "to aid the Commonwealth in preserving the Walden of Emerson and Thoreau, its shores and nearby woodlands for the public who wish to enjoy the pond, the woods and nature, including bathing, boating, fishing and picnicking." As a result of the gradually increasing use of the pond for the latter purposes, the Commissioners in charge gradually built more roads and buildings, changed the grading, etc., around the pond, and cut down a substantial number of trees. In a taxpayers' action to enjoin this continuing construction, the Massachusetts Court held that the primary purpose of the grant was to preserve Walden Pond "as closely as practicable in its state of natural beauty," but that, subject to this overruling purpose, limited provision could be made to facilitate (as subsidiary activities) bathing and the other activities mentioned in the grant. After reviewing the construction program in detail, the Court held that a substantial part of it violated the terms of the grant and specified exactly what could and could not be done.

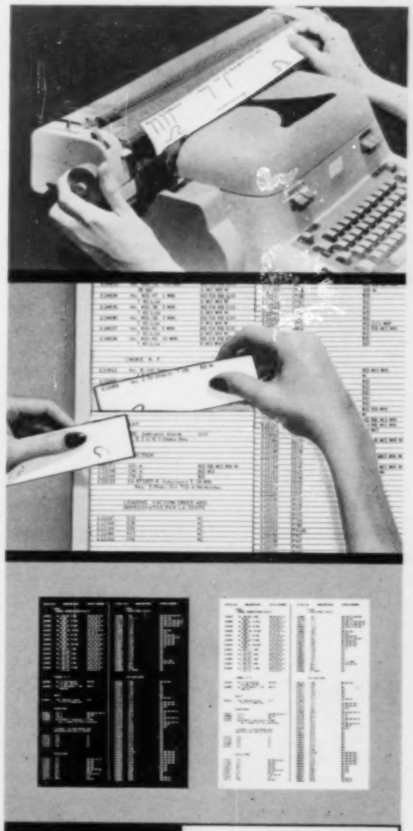
Flood Plain Zoning Ordinance in Ohio

OHIO. *State of Ohio* ex rel. *Brizes v. de Pledge*, 162 *North Eastern* (2d) 234 (Court of Appeals (intermediate court), June 19, 1958.)

A 1951 zoning ordinance for Eastlake, Ohio, established certain areas as flood-plain districts; and this case involved a cottage located (and relocated) within such an area. The zoning provisions on nonconforming uses forbade re-occupancy of a nonconforming building which was unoccupied for one year, and forebade restoring or moving a nonconforming building, except to make it conforming. After a 1954 flood, a small cottage was moved approximately 600 feet, without a permit, and was apparently then left unoccupied for two years. The State Fire Marshal later ordered certain repairs, but the local authorities refused a permit for such work. The exact extent of nonconformity was not indicated in the opinion.

In the opinion, the court upheld the zoning ordinance as "constitutional in all respects," and noted that the zoning ordinance had been violated by moving the cottage without a permit.

While the validity of flood plain zoning is a most important constitutional question, this opinion does not contain enough facts to permit an evaluation of its significance in this field.



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LEGAL NOTES AND DECISIONS

Prepared by NATIONAL INSTITUTE OF MUNICIPAL LAW OFFICERS, Charles S. Rhyne, General Counsel

Building Permits—
Cement Block Manufacturer—Denied

In proceeding on application to erect buildings by manufacturer of cement blocks on land in industrial zone which prohibited any industry which was offensive because of vibration or emission of dust, held permit denied. *Wher* v. *Crowley*, 186 N.Y.S.2d 197 (N. Y. Sup. Ct., App. Div., May 13, 1959)

Civil Service—
Suspension of Police Captain Invalid

Where personnel code gave director power to suspend classified employees for reasonable time without pay, held indefinite suspension of police captain for failure to report to duty in full uniform was invalid since "indefinitely suspended" does not mean suspended for reasonable time. *Gartsu* v. *Walsh*, 152 A.2d 225 (R.I., June 18, 1959)

Condemnation—
Court's Examination of Witness Upheld

In condemnation proceeding where no objections were made to court's participation in examination of expert witnesses, held complaint could not be made on appeal. *In Re Site for Civic Center City of Seattle*, 341 P.2d 148 (Wash., July 2, 1959)

Fall on Gutter—City Not Liable

In action by pedestrian against city to recover for injuries sustained when she stepped in depression in gutter adjacent to curbstone leading to sidewalk at unlighted intersection, held city not liable. *Berg.* v. *City of Long Beach*, 186 N.Y.S.2d 401 (N.Y., Long Beach City Ct., May 25, 1959)

Firemen—Pay Raise Not Budgeted—Rights Upheld

Where municipal ordinance entitled firemen to pay raises but council failed to make budgetary provision for increased salary, held such inaction would not excuse council from paying salary increase where firemen did not sleep on rights. *Parrack* v. *City of Phoenix*, 340 P.2d 997 (Ariz., June 24, 1959)

Licenses—
Refusal of Issuance by Clerk Reversed

In action relating to qualification of applicant for license to practice optometry where ordinance vested in city clerk purely arbitrary discretion to refuse to issue license, held ordinance invalid. *Busch Jewelry Co.* v. *City of Bessemer*, 112 So.2d 344 (Ala., May 21, 1959)

Parking Lots—
Use of Private Property—New Trial

In action concerning property dedicated to city on condition it be used for public park where city converted property into parking lot and plaintiff seeks reversion on breach of condition, held new trial ordered as to whether such use violated condition of dedication. *Abbot Kinney Co.* v. *City of Los Angeles*, 340 P.2d 14 (Cal. App., May 27, 1959)

Workmen's Compensation—
Fire Chief in Personal Car—City Liable

In action relating to death of fire chief in automobile accident involving his personal car where Workmen's Compensation awarded against city, held award valid since injury had arisen out of course of decedent's employment. *City of Holdenville* v. *Bise*, 341 P.2d 588 (Okla., June 30, 1959)

Zoning—Cemetery Not "Religious Use"

Where zoning ordinance provided that district was zoned for agricultural and residential uses but "religious uses" might be made of land, held use of land for cemetery even by religious society was not permitted. *Appeal of Russian Orth. Church etc. of Ambridge*, 152 A.2d 489 (Pa., June 30, 1959)

Zoning—
Filling Station in Residential Permitted

In action concerning application for variance to permit erection of filling station in residential zone, held evidence clearly showed substantial hardship and no abuse of discretion in granting variance. *Ferry* v. *Kownacki*, 152 A.2d 456 (Pa., June 30, 1959)

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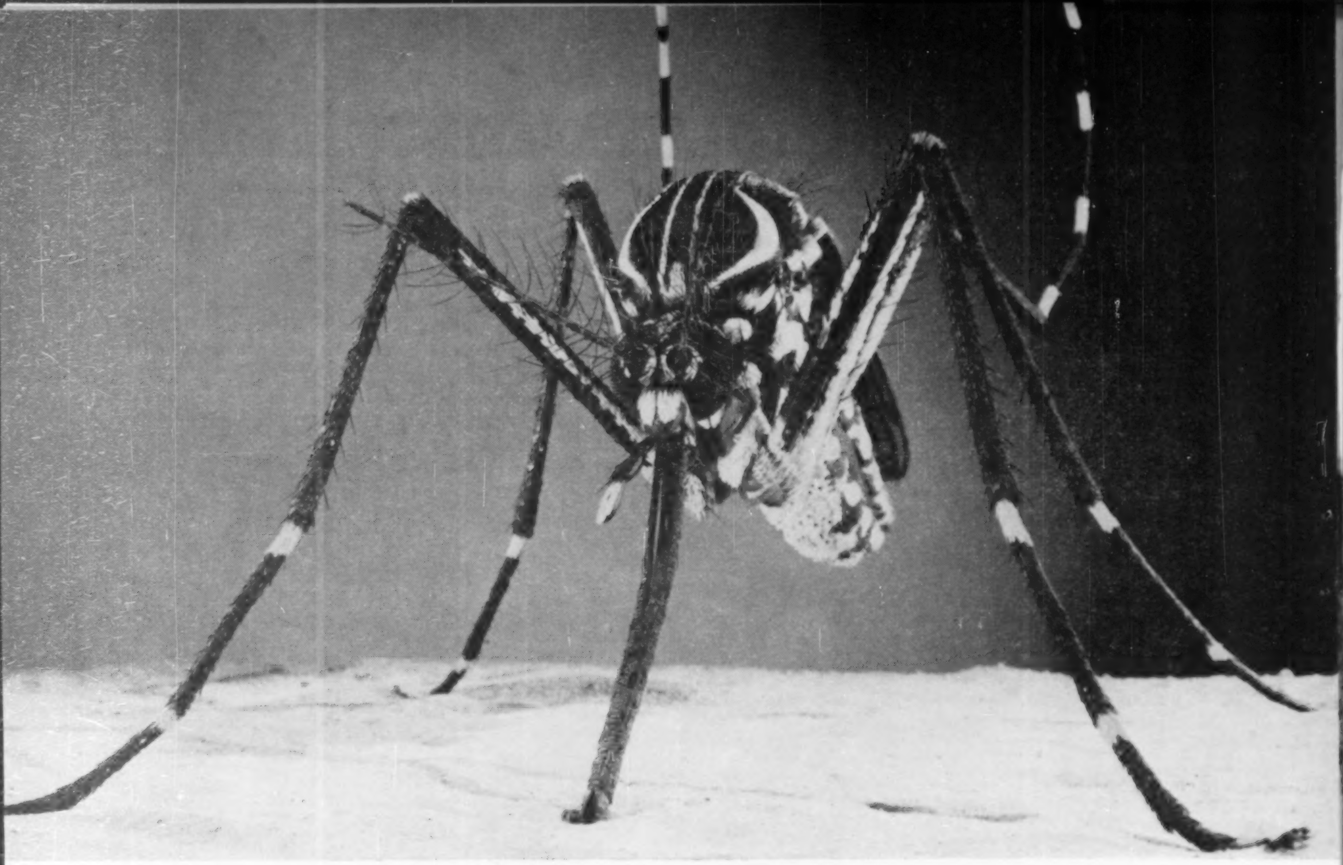

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60% kill of mosquitoes in area control work is no longer good enough. 90% *plus* is what you can expect with a malathion-Lethane combination. The cost? Comparable to presently-used but *far less effective insecticides.*

Controls larvae and adults

Malathion plus Lethane gives spectacular results on both life stages. While recommended rates are generally higher, 1/10 lb. per acre has given excellent control of adult mosquitoes in Florida. Hundreds of thousands of acres are being treated yearly for larvae in California at 1/2 lb. per acre with similar results.

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While malathion is replacing less effective insecticides in all areas, it is particularly useful in the many areas where mosquitoes have become resistant to chlorinated insecticides. Here, authorities have switched almost exclusively to malathion because it is *the* phosphate with low toxicity to warm-blooded animals. The U.S. Public Health Service reports that malathion is actually less toxic than DDT. Vector control authorities, park and city managements are specifying malathion for its combination of mosquito-killing power and safety in use. It can be applied by air, thermal fogging and mist spraying with equally good results.

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Malathion formulations are supplied to area control authorities by many well-known manufacturers under their own brand names. *Write to American Cyanamid Company,* maker of technical malathion, for detailed information on area mosquito control. American Cyanamid Company, Agricultural Division, New York 20, New York.

The label instructions on Cyanamid products, and on products containing Cyanamid ingredients, are the result of years of research and have been accepted by Federal and/or State Governments. Always read the labels and carefully follow directions for use.

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RECENT CITY MANAGER APPOINTMENTS

C. A. Keene
Sebastopol, Calif.

S. F. Van de Putte
Glendale, Ariz.

R. Powell Black
Florence, S. C.

H. W. Willingham
Athens, Tex.

Leland F. Kraft
Walla Walla, Wash.

O. K. Armstrong, Jr.
Winter Haven, Fla.

O. K. Armstrong, Jr., has been appointed manager of Winter Haven, Fla., succeeding Walter J. Slattery. Mr. Armstrong had been on the staff of Metropolitan Dade County (Fla.) Planning Department and before that was an administrative assistant to the manager of Dade County.

James L. Asher, manager of Whitwell, Tenn., has been appointed manager of Pocomoke City, Md.

R. Powell Black, manager of Dothan, Ala., has been appointed manager of Florence, S. C., succeeding Aaron Marsh. Mr. Black has been manager of Jasper, Ala., Athens, Tenn., and Aiken, S. C.

Terrell Blodgett, assistant city manager of Austin, Tex., has been appointed manager of Waco, Tex., succeeding Jack W. Jeffery.

Raymond P. Botch, manager of Elgin, Ill., has been appointed manager of Rock Island, Ill., succeeding R. D. Heitsch, Jr.

Alan Bruce, former assistant administrator, has been appointed county administrator of Marin County, Calif., succeeding Donald A. Jensen.

Richard Calland, acting manager of Beloit, Wis., since the death of Archie D. Telfer, has been appointed manager of that city.

Donald Creighton has been appointed manager of Moon Township, Pa., succeeding John Freeman.

Roy Eames, manager of Sweet Home, Ore., for the past seven years, has been appointed manager of Grants Pass, Ore., succeeding Hugh McKinley.

Lee Ellis, finance director, Winnetka, Ill., has been appointed manager of that city succeeding Charles R. Miller.

M. O. Gardner, manager of Forest Grove, Ore., for nearly 13 years, has been appointed manager of Pendleton, Ore., succeeding Andrew J. Browning.

Richard I. Gorman of Kalamazoo, Mich., has been appointed manager of Petoskey, Mich. Mr. Gorman succeeds Ernest L. Neumann.

Donald L. Grimes, administrative assistant, Highland Park, Ill., has been appointed manager of Emporia, Va., succeeding George R. House, Jr.

David Harpine, councilman of Mars Hill, Me., has been appointed manager of that city, succeeding Stanley Lavery.

Richard M. Henneberger, Jr., manager of Rangely, Colo., has been appointed manager of St. Louis, Mich., succeeding Donald P. Ziemke.

Harold J. Hilliard has been appointed manager of Opa-Locka, Fla., succeeding Walter J. Brown, Jr.

Donald L. Hitchman, assistant manager of Salem, Ore., has been appointed the first manager of Mercer Island, Wash.

Chester A. Hostetler, acting city manager and former controller of Anchorage, Alaska, has been appointed manager of that city.

Earl B. Joiner, mayor of Newnan, Ga., has been appointed the city's first manager.

Charles A. Keene is the new manager of Sebastopol, Calif., succeeding M. S. Hetzel.

Leland F. Kraft, former city manager of Wood River, Ill., was recently appointed the first city manager of Walla Walla, Wash. Mr. Kraft was previously assistant city manager of University City, Mo.

Robert H. Langkawel, a member of the city council of Whitehall, Mich., was recently appointed manager of that city succeeding Carlton W. Laird.

Frank H. Lawler, manager of Ottumwa, Iowa, for nearly three years, has been appointed manager of West Palm Beach, Fla., succeeding James J. Mott.

W. Raymert Miller, director of public works of Columbia, Mo., has been appointed the first manager of Sikeston, Mo.

Robert J. McNay, project coordinator of Montgomery County, Ohio, has been appointed the first manager of Trotwood, Ohio.

Robert J. McNutt, manager of Southfield, Mich., has been appointed manager of Scottsdale, Ariz., succeeding Gordon W. Allison.

(Continued on page 192)

C. W. Woolums
Twinsburg, Ohio

R. I. Gorman
Petoskey, Mich.

R. H. Langkawel
Whitehall, Mich.

W. T. Potter
Avalon, Pa.

W. H. Scovell
Pompano Beach, Fla.

Terrell Blodgett
Waco, Tex.

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(Continued from page 191)

W. Thomas Potter, assistant to the manager of the Borough of Sharpsville, Pa., has been appointed manager of Avalon, Pa., succeeding Wilfred E. Froehlich.

Ralph W. Precious, manager of Oxford, Mich., has been appointed manager of St. Johns, Mich., succeeding Kenneth W. Anderson.

William H. Scovell of Miami Beach has been appointed manager of Pompano Beach, Fla. Mr. Scovell was previously manager of Kissimmee, Fla.

Stanley F. Van de Putte, acting manager of Glendale, Ariz., has been appointed manager of that city succeeding W. A. Gilchrist. Mr. Van de Putte was formerly chief of police of Glendale.

Samuel E. Vickers, manager of Long Beach, Calif., has been appointed manager of Phoenix, Ariz., succeeding Ray W. Wilson, who has retired. Mr. Vickers, who has a master's degree in public administration from Northwestern University, was previously manager of Vallejo, Calif. He was president of the International City Managers' Association in 1956 and is presently a member of the ICMA Executive Board.

Howard W. Willingham, administrative assistant, Corpus Christi, Tex., was recently appointed the first city manager of Athens, Tex. Mr. Willingham was previously administrative aide and water distribution superintendent in Lubbock, Tex.

Calvin W. Woollums, manager of Whitwell, Tenn., has been appointed manager of Twinsburg, Ohio, succeeding Alexander J. Day.

Donald P. Ziemke, manager of St. Louis, Mich., for the last six years, was recently appointed city manager of Muskegon Heights, Mich.

Orin F. Nolting
Executive Director
International City Managers' Association

Phoenix Intern Program Starts Twelfth Year

Phoenix, Ariz., begins its twelfth year of its administrative internship program. Internships will begin on July 1, each for a minimum 12-month period.

The city fills these vacancies with young men who desire to train themselves for careers in municipal administration or city management and who are qualified by training and temperament to succeed in this field. Candidates must have completed all required courses for a master's degree in government management, public administration, business administration, engineering or similar curricula.

The city manager assigns these interns to the Division of Research and Budget Officer who is qualified by both training and experience to supervise this type of program. Permanent administrative analysts assigned to the division also help guide the work of the interns. The city manager takes a close personal interest in the interns and his door is always open to them. Interns attend all staff meetings and make frequent contacts with the various departments and division heads in the city government.

The work assigned to interns involves research studies in government, administrative procedures, work methods, and other special problems. They fill in during vacations in the manager's office, handling complaints and doing other work. They also participate in long-range planning, administrative reporting, budget preparation, and other management functions.

Interns receive a salary ranging from $420 to $525 monthly. They are eligible for the same benefits as other city employees, including vacation, sick leave, and other benefits, as well as periodic merit salary increases.

Upon satisfactory completion of the one-year internship period, an intern will have an opportunity to continue his employment with the city. If the intern is interested in doing so, he may remain on the Research and Budget staff as an intern for a second year at a higher salary, or he may qualify for other administrative assistant or analyst position in the city as openings occur.

During the 11 years the program has been in operation, graduate schools of the following universities have been represented: Arizona State; Brigham Young (Provo, Utah); California (U.C.L.A.); Colorado; Cornell; Denver; Florida; Iowa; Kansas; Minnesota; Pennsylvania; Southern California; Texas; Washington; and Wayne (Detroit). Of the 32 men who have completed their internships, 11 are now city or county managers, eight are administrative assistants, and two are municipal finance directors. One is in military service, two are with the federal government, one is a teacher, and one is an administrative analyst in a large city. Only three of the 32 have departed from the field of government.

Three former interns now hold positions with the City of Phoenix. They include the Assistant Public Works Director, Research and Budget Officer, and an Administrative Analyst. Former Phoenix interns are considered for filling permanent administrative staff positions for which they are qualified.

Applications for the current program must be submitted to Personnel Director L. J. Brenneman, 224 West Washington, Phoenix 3, Ariz., prior to March 15. ◄◄

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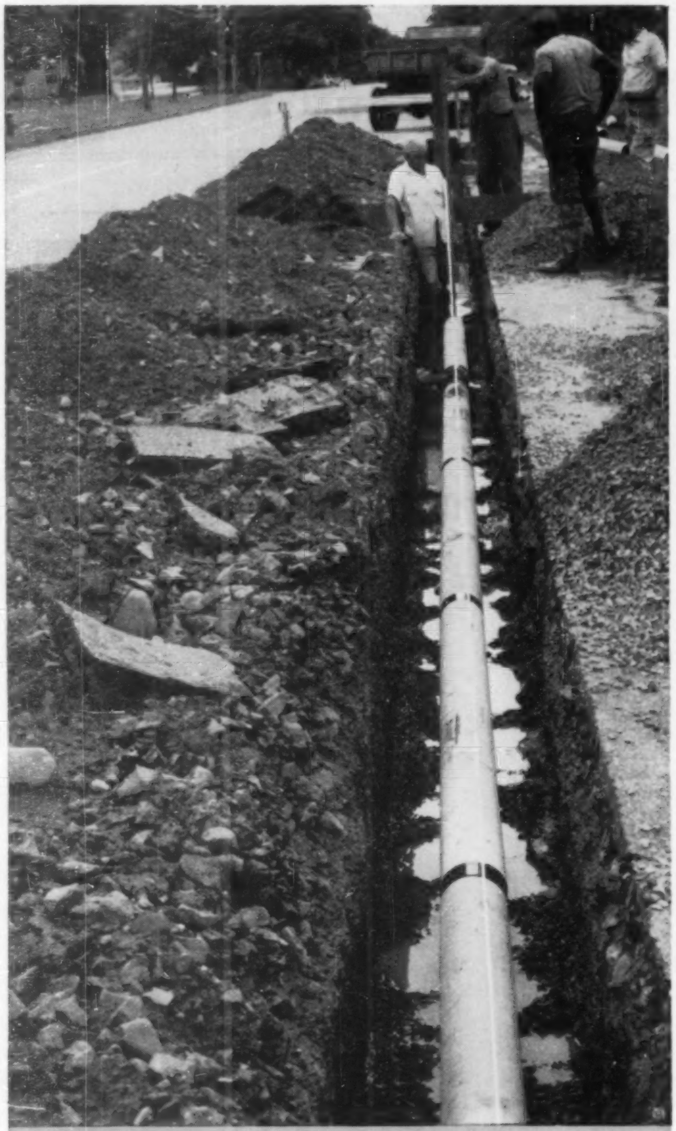
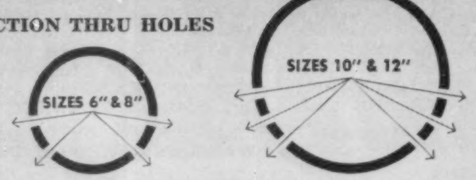


SECTION THRU HOLES



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10	1,100	13
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- **Excellent alignment, tight joints, low material cost for new installation economies**

For highways, airports, dams, industrial plant sites—anywhere there's a subsurface drainage job to be done—Johns-Manville Transite® Underdrain Pipe does it effectively and economically.

The plastic coupling used with Transite Underdrain Pipe assures a permanently tight, *flexible* joint . . . keeps out water-borne silt and maintains permanent pipe alignment. And, because of Transite's long (10 ft. and 13 ft.) lengths, fewer joints are needed in the line.

Made of tough, durable asbestos and cement, Transite Underdrain Pipe won't rust. Its interior is made smooth to stay smooth, assisting the flow of water and reducing the opportunity for solids to find a resting place in the line. As a result, the perforations are able to perform their function of permitting entry of ground water into the line , at a maximum rate, where it can be quickly carried off.

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CONVENTIONS — WHEN AND WHERE

Conventions listed this month for the first time are indicated by an asterisk (*)

Mar. 8-10—San Francisco, Calif.
California Municipal Utilities Assoc. Annual Meeting (Sheraton-Palace Hotel). Exec. Sec., F. V. Frey, 100 N. Garfield Ave., Rm. 108, Pasadena, Calif.

Mar. 12-17—College Sta., Tex.
Texas Water and Sewage Works Association. Annual Meeting (Memorial Student Center, Texas A&M College). Exec. Dir., G. R. Herzik, Jr., 1100 West 49th St., Austin, Tex.

Mar. 13-16—Bal Harbour, Fla.
American Concrete Pipe Association. Annual Meeting (Americana Hotel). Man. Dir., Howard F. Peckworth, 228 No. La Salle St., Chicago 1, Ill.

Mar. 15-17—Atlantic City, N. J.
New Jersey Water Pollution Control Assoc. Annual Meeting (Traymore Hotel). Sec., Anthony T. Leabey, P. O. Box 32, West Trenton, N. J.

Mar. 19-21—New Orleans, La.
Southern Association of Chemical Organization Executives. Annual Meeting (Sheraton-Charles Hotel). Pres., Fred Pool, East Texas Chamber of Commerce, Longview, Texas.

Mar. 19-22—Little Rock, Ark.
Arkansas Water and Sewage Conference. Annual Conference (Marion Hotel). Exec. Sec., C. W. Oxford, Univ. of Arkansas, Fayetteville, Ark.

Mar. 22-24—Chicago, Ill.
American Water Works Assoc.—Illinois Section. Annual Meeting (LaSalle Hotel). Exec. Sec., Dewey W. Johnson, 3440 Prudential Plaza, Chicago, Ill.

Mar. 22-24—Atlantic City, N. J.
Association of Highway Officials of the North Atlantic States. Annual Meeting (Traymore Hotel). Exec. Sec., Kenneth D. Rice, 1035 Parkway Ave., Trenton, N. J.

Mar. 27-30—Lafayette, Ind.
Purdue Road School. Annual Meeting (Memorial Center, Purdue Univ.). Exec. Sec., J. F. McLaughlin, Civil Engineering, Purdue University, Lafayette, Ind.

Mar. 29-31—Atlantic City, N. J.
New Jersey Mosquito Extermination Association. Annual Meeting (Hotel Haddon Hall). Sec., Bailey B. Pepper, Agricultural Experiment Station, New Brunswick, N. J.

Apr. 4-6—Jacksonville, Fla.
National Recreation Association—Southern Section. Annual Conference (George Washington Hotel). Dir., Fld. Serv., Charles E. Reed, NRA, 8 W. 8th St., N. Y. 11, N. Y.

Apr. 4-7—Cedar Rapids, Iowa
National Recreation Association — Midwest Section. Annual Conference (Roosevelt Hotel). Dir., Field Services, Charles E. Reed, NRA, 8 W. 8th St., N. Y. 11, N. Y.

Apr. 4-7—Tulsa, Okla.
National Recreation Association—Southwest Section. Annual Conference (Hotel Tulsa). Dir., Field Services, Charles E. Reed, NRA, 8 W. 8th St., New York 11, N. Y.

Apr. 5-6—Beckley, W. Va.
American Water Works Assoc.—West Virginia Section. Annual Meeting (Hotel Beckley). Sec., Hugh W. Hetzer, Design Engineering, Union Carbide Chemicals Co., P. O. Box 8361, S. Charleston 3, W. Va.

Apr. 5-8—Philadelphia, Pa.
American Society for Public Administration. Annual Meeting (Hotel Sheraton). Exec. Dir., Robert J. M. Matteson, 6042 Kimbark Ave., Chicago 37, Ill.

Apr. 6-7—Durham, N. Car.
Southern Municipal and Industrial Waste Conference. Annual Conference (Duke University). Sec., Dr. Edward H. Bryan, Assoc. Prof. of Civil Engineering, Duke University, Durham, N. Car.

***Apr. 6-7—Bluefield, W. Va.**
West Virginia Water Pollution Control Assoc. Annual Meeting (West Virginia Hotel). Sec.-Treas., Glen O. Fortney, State Department of Health, Charleston 5, W. Va.

Apr. 6-8—Helena, Mont.
American Water Works Association—Montana Section. Annual Meeting (Placer Hotel). Sec. H. W. Clarkson, c/o State Board of Health, Helena, Mont.

(Continued on page 198)

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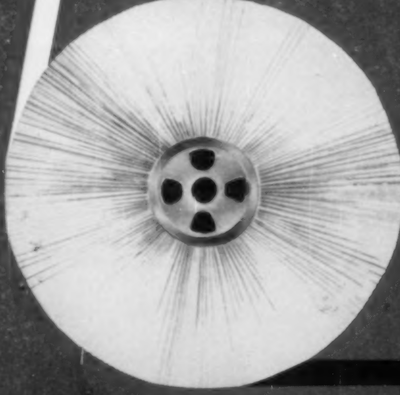

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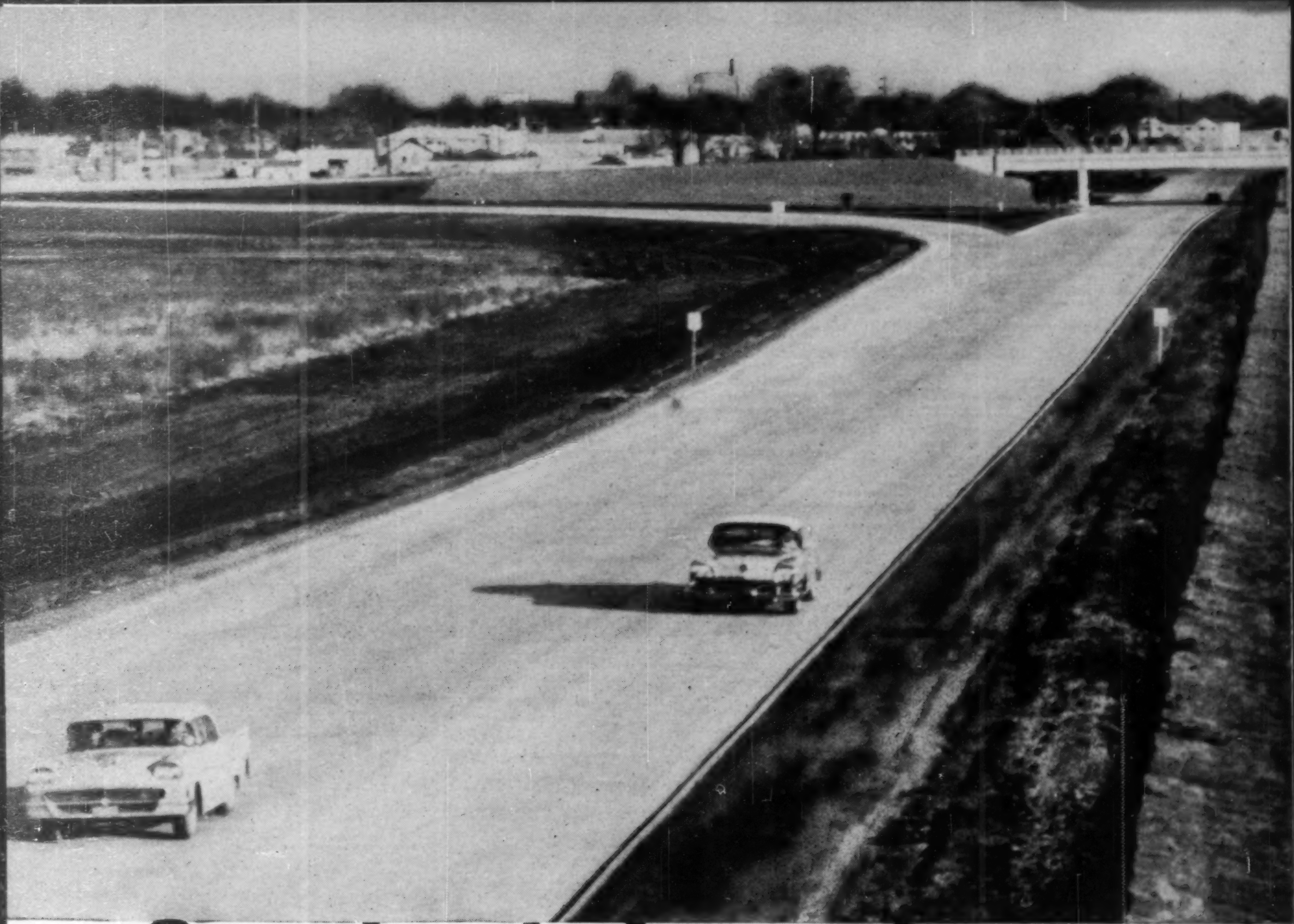


Steel reinforced ...to stand up

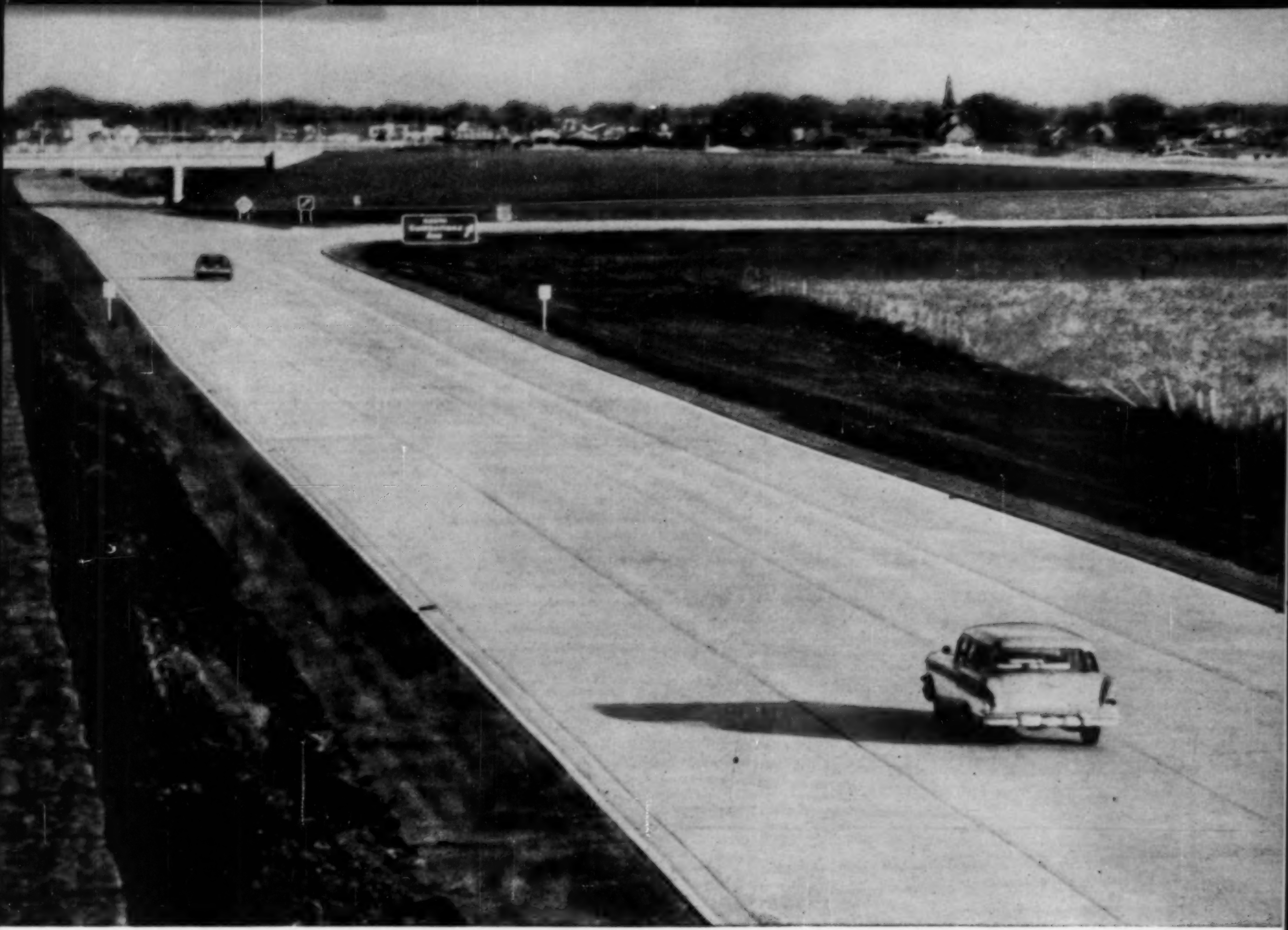
PROJECT: Portion of Northwest Expressway just west of Cumberland Avenue Interchange, Cook County, Illinois

OWNER: Cook County Department of Highways

CONTRACTORS: Arcole Midwest Corp., Evanston, Illinois

WIRE FABRIC DISTRIBUTOR: E. W. Zimmerman, Inc., Chicago, Illinois

This mark tells you a product is made of modern, dependable Steel.



under the hi-speed pounding of modern traffic

Cook County, Illinois has opened the first section of its new Northwest Expressway. And, like other expressways built under the authority and supervision of that county's Department of Highways, it is steel reinforced.

An anticipated daily count of 31,000 vehicles is expected on this newly opened 4½-mile section which extends from Foster & Central Avenues to the Illinois Toll Highway. This figure indicates what this already busy strip will be subjected to as the traffic load gets heavier. And it points up the importance of building into all new roads and highways the strength it will take to stand up under the almost ceaseless pounding of modern hi-speed traffic in the years ahead.

Highways reinforced with steel have a balanced design in that all edges and corners are fully protected. USS American Welded Wire Fabric accomplishes distributed load transfer and reduces stresses about 30% which accounts for the truly superior performance of reinforced concrete over non-reinforced concrete. Reinforced pavements provide a safe, smooth riding surface that lasts.

USS American Welded Wire Fabric is today stronger than ever. Minimum tensile strength is now 75,000 psi and minimum yield point is now 60,000 psi. It has reserve strength for heavier pounding and it is available in a completely machine fabricated form, ready for immediate placement. For more information, write to American Steel & Wire, 614 Superior Avenue, N. W., Cleveland 13, Ohio. *USS and American are registered trademarks*

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Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, Distributors Abroad

Conventions—When and Where

(Continued from page 195)

Apr. 9-12—Tacoma, Wash.

National Recreation Association—Pacific Northwest Section. Annual Conference (Winthrop Hotel), Dir., Fld. Serv., Charles E. Reed, NRA, 8 W. 8th St., N. Y. 11, N. Y.

Apr. 10-11—Buffalo, N. Y.

American Water Works Assoc. — New York Section. Semi-Annual Meeting (Statler Hilton Hotel). Kimball Blanchard, c/o Neptune Meter Co., 22-22 Jackson Ave., Long Island City 1, N. Y.

Apr. 12-14—Hutchinson, Kans.

American Water Works Association—Kansas Section. Annual Meeting (Baker Hotel). Sec.-Treas., H. W. Badley, 119 W. Cloud, Salina, Kan.

Apr. 12-14—Hutchinson, Kan.

Kansas Water Pollution Control Assoc. Annual Meeting (Baker Hotel). Sec.-Treas., Howard F. Saiger, 1900 E. 9th St., Wichita, Kan.

Apr. 14-17—Muskegon, Mich.

National Recreation Assoc.—Great Lakes Section. Annual Conference (Occidental Hotel). Dir., Field Services, Charles E. Reed, NRA, 8 W. 8th St., New York 11, N. Y.

Apr. 18-20—Brookings, S. Dak.

Highway Short Course. Annual Meeting (Union Building). Sec., Emory E. Johnson, Head of the Department of Civil Engineering, S. Dak. State Coll., Brookings, S. Dak.

Apr. 19-21—Lincoln, Neb.

American Water Works Assoc. — Nebraska Section. Annual Meeting (Cornhusker Hotel). Sec., Joseph J. Rossbach, Metropolitan Utilities, 18th & Harney Sts., Omaha, Nebr.

Apr. 20-22—Chandler, Ariz.

Arizona Sewage and Water Works Assoc. —Annual Meeting (San Marcos Hotel). Sec.-Treas., A. D. Cox, Jr., P. O. Box 5347, Phoenix, Ariz.

***Apr. 20-22—Santa Monica, Cal.**

California Sewage and Industrial Wastes Assoc. Annual Meeting (Hotel Miramar). Sec.-Treas., Robert L. White, Bureau of Engineering, City Hall, Burbank, Cal.

Apr. 22-25—Colorado Springs, Colo.

American Assoc. of Airport Executives. Annual Meeting (Broadmoor Hotel). Exec. Sec., F. R. Hoyt, P. O. Box 767, Wilmington, Del.

Apr. 23-26—Greenville, S. Car.

American Water Works Association—Southeastern Section. Annual Meeting (Hotel Poinsett). Sec.-Treas., N. M. de Jarnette, 1081 Lanier Blvd., N. E., Atlanta 6, Ga.

Apr. 25-27—San Antonio, Tex.

American Public Power Association. Annual Meeting (Granada Hotel). Gen. Mgr., Alex Radin, 919 18th St., N.W., Washington 6, D. C.

Apr. 26-29—Victoria, B. C., Can.

American Water Works Association—Pacific N. W. Section. Annual Meeting (Empress Hotel). Sec.-Treas., Fred D. Jones, W. 2108 Maxwell Ave., Spokane 11, Wash.

Apr. 26-29—Santa Monica, Calif.

California Sewage & Industrial Wastes Assoc. Annual Meeting (Hotel Miramar). Sec.-Treas., Robert L. White, Box 231, Burbank, Calif.

Apr. 30-May 3—Washington, D. C.

Chamber of Commerce of the U. S. Annual Meeting (Chamber Building). Exec. V. Pres., Arch N. Booth, 1615 H St., N. W., Washington 6, D. C.

Apr. 30-May 4—Denver, Colo.

American Society of Planning Officials. Annual Meeting (Hotel Denver Hilton). Exec. Dir., Dennis O'Harrow, 1313 E. 60th St., Chicago 37, Ill.

***May 2-4—Lafayette, Ind.**

Purdue Industrial Waste Conference. Annual Meeting (Purdue Memorial Union). Chairman, Don E. Bloodgood, C. E. Bldg., Purdue University, Lafayette, Ind.

***May 8-9—Old Point Comfort, Va.**

Virginia Water Wastes and Sewage Works Association. Annual Meeting (Hotel Chamberlin). Sec.-Treas., O. J. Hand, Asst. to the Manager, Hercules Powder Co., Hopewell, Va.

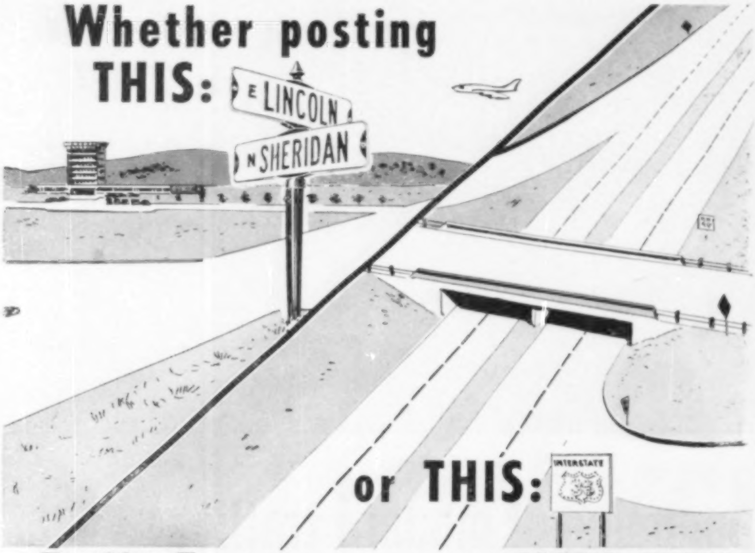
***May 8-10—Washington, D. C.**

National Highway Users Conference. Annual Meeting (Mayflower Hotel). Director, Arthur C. Butler, 966 National Press Building, Washington 4, D. C.

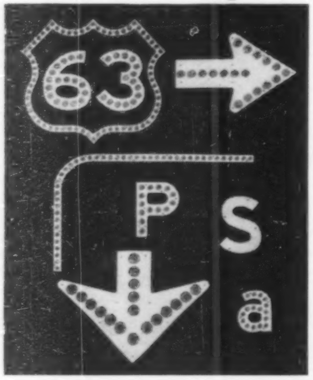
***May 10-12—Yuma, Ariz.**

League of Arizona Cities and Towns. Annual Meeting (Stardust Hotel). Exec. Dir., John J. DeBolske, 2727 N. Central Ave., Phoenix 4, Ariz.

(Continued on page 200)



Traffic Engineers turn to MIRO-FLEX



New Cut-Out Letters, Numbers, Shapes, Borders for Easy Signing

Miro-Flex offers a wide variety of pre-cut, aluminum individual letters, arrows, numerals, borders, corners, and shapes. Furnished plain or with choice of plastic lenses, reflective sheeting or unfinished. Conform to Bureau of Public Roads' and the American Association of State Highway Officials' standards. Make signs in your shop, or on-site, to interstate specifications.

Complete Line of Traffic Control Signs

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YIELD RIGHT OF WAY
KEEP RIGHT
STOP
DIP
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E LINCOLN
N SHERIDAN
NO LEFT TURN

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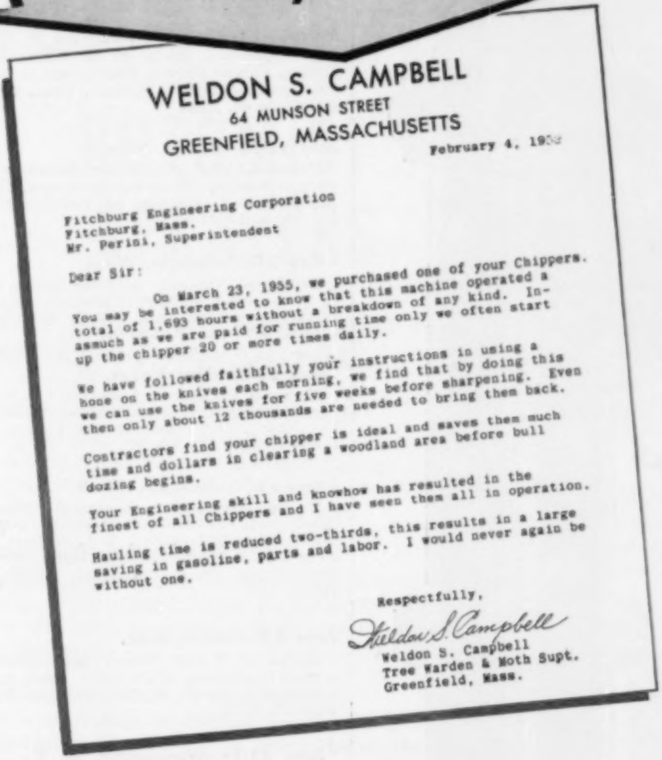
"OPERATES 1693 HOURS without a breakdown of any kind!"



WELDON S. CAMPBELL
64 MUNSON STREET
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February 4, 19

Fitchburg Engineering Corporation
Fitchburg, Mass.
Mr. Perini, Superintendent

Dear Sir:

On March 23, 1955, we purchased one of your Chippers. You may be interested to know that this machine operated a total of 1,693 hours without a breakdown of any kind. Inasmuch as we are paid for running time only we often start up the chipper 20 or more times daily.

We have followed faithfully your instructions in using a hone on the knives each morning, we find that by doing this we can use the knives for five weeks before sharpening. Even then only about 12 thousands are needed to bring them back.

Contractors find your chipper is ideal and saves them much time and dollars in clearing a woodland area before bull dozing begins.

Your Engineering skill and knowhow has resulted in the finest of all Chippers and I have seen them all in operation.

Hauling time is reduced two-thirds, this results in a large saving in gasoline, parts and labor. I would never again be without one.

Respectfully,

Weldon S. Campbell
Weldon S. Campbell
Tree Warden & Moth Supt.
Greenfield, Mass.

Fitchburg Wood Chippers are engineered to stand hard use, to give long service without excessive maintenance costs.

That's the "reason why" successful men like Weldon Campbell prefer Fitchburg for the tough brush removal jobs.

Fitchburg Chippers are designed by engineers for busy, trouble-free service. The exclusive spring-activated feed plate adjusts itself automatically—provides protection from damaging foreign material—assures smooth, efficient operation. The power take-off clutch gives safe starts and stops. There's no fly wheel to cause bearing trouble. These features keep a Fitchburg Chipper on the job . . . save you time and money.

Read (at right) what others say about their Fitchburg Wood Chippers, and send for your free copy of "Chip Dollars" today.

FITCHBURG ENGINEERING CORPORATION FITCHBURG, MASS.

"Our Fitchburg Chipper has been inexpensive to maintain and trouble-free in operation, and has meant a great saving to us in time and labor."
—F. A. Canuso & Sons, Inc.
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"During about 2,000 operating hours we have suffered neither employee accident due to chipper operation, nor major mechanical failure."
—Northern Tree Company, Inc.
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"The Fitchburg Chipper is well constructed. The machine is trouble-free and easily maintained."
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K-10 FIRE HYDRANT...

Combines lower installation and maintenance costs with maximum protection

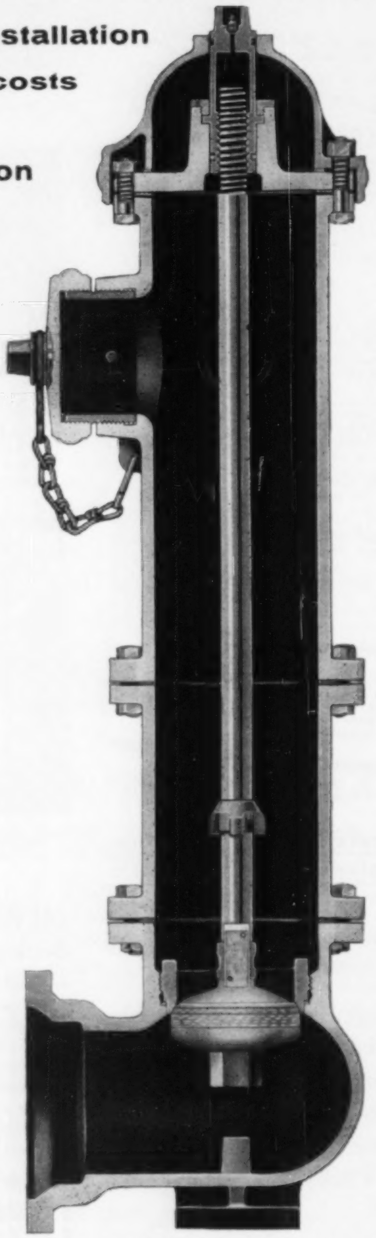
The new KENNEDY K-10 Hydrant features "O" Ring seals, a weather seal and a pressure seal. These seals eliminate packing and assure clean, absolute protection of the inner working parts. "O" Rings are permanently installed and require no adjustment.

The K-10 contains an absolute minimum number of working parts, all of which can be removed for maintenance or repair within excavation. Ruggedly constructed, the K-10 Hydrant also features straight line operation and reaches a new high in working efficiency with smooth, large area internal passageways.

Large stems and stem nuts facilitate operation and provide extra strength and safety. Nozzle rotation can be made by utilizing the bolted joint and the spool.

- *Before you specify, get all the hydrant facts from KENNEDY. Write for Bulletin 591.*

The K-10 Fire Hydrant conforms to A.W.W.A. specifications and is available in three sizes, 4, 4½, and 5 inch and in a variety of pipe end connections.



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K-10 FIRE HYDRANT

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DUCTILE IRON VALVES • CAST IRON VALVES • BRONZE VALVES • INDICATOR POSTS • FIRE HYDRANTS

Conventions—When and Where

(Continued from page 198)

***May 14-19—Minneapolis, Minn.**
National Conference on Social Welfare. Annual Meeting (Municipal Auditorium). Exec. Sec., Joe R. Hoffer, 22 W. Gay St., Columbus 15, Ohio.

***May 15-17—Chattanooga, Tenn.**
Tennessee Municipal League. Annual Meeting (Patten Hotel). Exec. Sec., Herbert J. Bingham, 226 Capitol Blvd., Room 306, Nashville 3, Tenn.

May 15-18—New York, N. Y.
International Institute of Municipal Clerks. Annual Meeting (Manhattan Hotel). Sec.-Treas., Arthur J. Shinner, Town Hall, Brookline 46, Mass.

May 15-19—Detroit, Mich.
National Fire Protection Association. Annual Meeting (Hotel Statler). Asst. Gen. Mgr., Chas. S. Morgan, 60 Batterymarch St., Boston 10, Mass.

***May 21-25—Seattle, Wash.**
Municipal Finance Officers Assoc. of U. S. and Canada. Annual Meeting (Olympic Hotel). Exec. Dir., Joseph F. Clark, 1313 E. 60th St., Chicago 37, Ill.

***May 22-25—Manchester, Vt.**
National Recreation Association — New England Section. Annual Conference (Equinox Hotel). Dir. Field Services, Charles E. Reed, NRA, 8 W. 8th St., N. Y. 11, N. Y.

***May 25-26—Pullman, Wash.**
Pacific Northwest Industrial Waste Conference. Semi-annual Meeting (Washington State University). Sec., William H. Knight, P. E. Head, Technical Exten. Serv., Washington State University, Pullman, Wash.

June 4-9—Detroit, Mich.
American Water Works Association—Annual Convention (Cobo Hall). Exec. Sec., Raymond J. Faust, 2 Park Avenue, New York 16, N. Y.

***June 11-14—Washington, D. C.**
United States Conference of Mayors. Annual Meeting (Statler Hilton Hotel). Exec. Dir., Harry R. Betters, 1707 H. St., N. W., Washington 6, D. C.

***June 15-20—Washington, D. C.**
International Union of Local Authorities, sponsored by the U. S. Conference of Mayors, the American Municipal Assoc., and the International City Managers' Assoc. Annual Meeting. Exec. Dir., Schuyler Lower, Washington Secretarial, World Conference of Local Governments, Room 526, District Building, Washington 4, D. C.

Sept. 24-27—Minneapolis, Minn.
American Public Works Association. Annual Meeting (Municipal Auditorium). Exec. Dir., Robert D. Bugher, 1313 East 60th Street, Chicago 37, Ill.

Sept. 24-28—Poland Spring, Me.
New England Water Works Association. Annual Meeting (Poland Spring House). Sec., Joseph C. Knox, 73 Tremont St., Boston, Mass.

Oct. 9-12—Milwaukee, Wisc.
Water Pollution Control Federation. Annual Meeting (Milwaukee Auditorium and Schroeder Hotel). Exec. Sec., Dr. Ralph E. Fuhrman, 4435 Wisconsin Ave., Washington, D. C.

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ONLY ROTOMIST GIVES YOU THESE IMPORTANT ADVANTAGES

GREATER RATE-OF-WORK CAPACITY
Rotomist delivers more cubic feet of air per horsepower with its exclusive straight-through air flow design. This big capacity means more trees covered per day, lower spraying costs per tree.

THOROUGH COVERAGE
Rotomist performance is unequalled. High pressure breaks up the spray into fine particles. Spray reaches even the critical topmost branches for complete tree coverage.

COMMUNITY-WIDE VERSATILITY
Taxpayer dollars go farther because Rotomist is a versatile worker. In many communities the Rotomist is seldom idle. When not being used for shade tree or fly-mosquito control spraying, it is busy windrowing leaves or being used for brush burning.

SELECT THE ROTOMIST THAT'S RIGHT FOR YOUR NEED AND BUDGET

91 ROTOMIST	100 ROTOMIST	301 ROTOMIST
New standard for all-mechanical movement. Capacity nearly that of famous 100. Reach those tall street trees. All-purpose uses*.	Standard of the industry. Reaches tops of tall trees even with prevailing winds. Up to 400 trees per tank; no splash on autos. A one-operator machine. Fine mist coverage, fast drying, good residual deposit.	Covers 50 to 100 per cent more trees per day. Get those off-street trees, more trees per tank. Wind not as much of a factor as in smaller sprayers.

**John Bean Rotomists are also all-purpose high pressure sprayers. Just attach hose and gun to high pressure pump outlet. Also available are models 50 and 51, specially designed for fly and mosquito control spraying.*

FOR
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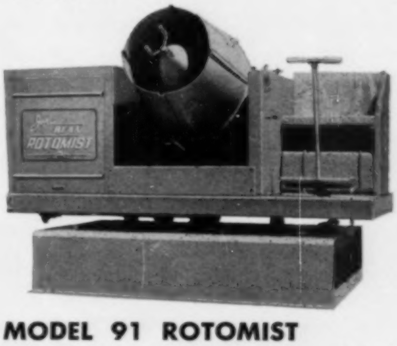
NEW MODEL 301 IN ACTION

Greatest rate-of-work of any mist sprayer. Now, at lower cost than ever, reach tops of tallest trees—off street, hard-to-get-at trees.



NEW MODEL 91 ROTOMIST

Available in trailer or skid mounted models, the economical Model 91 has "big" Rotomist features. Powered 360 degrees, gravity-centered rotation.

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- ☐ Facts on Dutch Elm Disease
- ☐ Facts on Mosquito Control

MUNICIPAL AND CIVIC PUBLICATIONS

Publications on these pages are available from the addresses indicated and are usually free unless a price is given.

Water Facilities Inventory

MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958; A COOPERATIVE STATE-FEDERAL REPORT. U. S. Department of *Health, Education, and Welfare, Public Health Service, Washington 25, D. C.*

The first four of nine scheduled volumes of an inventory of water facilities for the approximately 20,000 United States communities of more than 100 population. The new inventory differs from the last one conducted in 1947-1948 in that it includes names of communities that do not have any public water supply. The inventory includes such data as ownership, age of equipment, type of laboratory control, number of meters, source of supply and safe yield of water, and types of water treatment—aeration, chemical, mixing device and similar information. The complete set of nine volumes will be issued during the next few months in a series corresponding to the nine regions of the Department of Health, Education and Welfare.

The volumes now available from the Superintendent of Documents at prices noted include the following states:

Region III: District of Columbia, Kentucky, Maryland, North Carolina, Virginia, West Virginia, Puerto Rico, Virgin Islands—65 cents.

Region IV: Alabama, Florida, Georgia, Mississippi, South Carolina, Tennessee—60 cents.

Region VI: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota—70 cents.

Region VIII: Colorado, Idaho, Montana, Utah, Wyoming—40 cents.

New Efficiency In Beach Cleaning

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The BEACH CLEANER can clean your beaches of debris—moving under the surface to a depth of 1 to 6 inches, it gathers cigarette butts to items 12 inches in diameter.

SELF-PROPELLED BEACH CLEANER OFFERS THESE FEATURES:

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—— For Full Details, Write ——

Lockwood Graders

Gering, Nebraska

Concrete Reference Book

CONCRETE ENGINEERING HANDBOOK—*By William S. LaLonde, Jr., Milo F. Janes, and a staff of specialists. McGraw-Hill Book Company, Inc., 330 West 42nd St., New York 36, N. Y.* 1,216*pp.* 1961. $25.

A single volume containing fundamental and practical information in the field of reinforced concrete for those who have been professionally trained. The wide range of material includes not only design methods for various types of structures, but also special resumes on structural theory, torsion, materials, and construction methods. It contains 735 illustrations including diagrams, tables and other design aids. A large section covers building design and the design of concrete chimneys, bins for bulk storage, pavements, bridges and skin structures. Special topics include the handling of deflections in building frames due to earthquake force, and applications of prestressed concrete. Tabular data, conveniently brought together, includes data to permit the rapid choice of concrete slabs, beams, and footings once loads or moments, shears and choice of fiber stresses are known.

Regional Progress

"MASSIVE COOPERATION"—*Office of the City Manager, City Hall, Salem, Ore.* 1960. 12*pp.*

City Manager Kent Mathewson, Salem, Ore., introduced and the Salem Chamber of Commerce quickly followed up the theory of "massive cooperation" by all local governments in the Salem metropolitan area on common problems. This report tells how it was done. This is the only report dealing with local-government problems that we can recall carrying an endorsement by the President of the United States.

Park Manuals

MANUAL FOR PARKS AND RECREATION BOARDS AND COMMISIONS—*by Edward A. Connell;* MUNICIPAL HANDBOOK FOR NEW GREEN COMMITTEE CHAIRMEN — *by Tom Mascaro. American Institute of Park Executives, Inc., Education and Research Division, Oglebay Park, Wheeling, West Va.* 1960. 40*pp. and* 27*pp. respectively. Members* $1; *non-members* $2.

A pair of handy manuals, one for the park department generally and one pinpointed at municipal golf courses.

New York in 1985

METROPOLIS 1985—*By Raymond Vernon. The University of North Carolina Press, Chapel Hill, N. C.* 1960. 252 *pp.* $5.

This reports itself to be an interpretation of the results of the New York Metropolitan Region study. But anyone who expects to learn what this region will look like in 1985 is due for disappointment. The author makes the common but mistaken assumption that present trends are going to continue. Consider how much

(Continued on page 205)

TOWN OF SWANSEA
HIGHWAY DEPT
PAYLOADER®

Can your tractor-shovel do this?

"The H-50 PAYLOADER with 4-in-1 versatility really pays", says R. S. Macomber, Supt. of Streets of Swansea, Mass. "After recent hurricane 'Donna' visited us the clean-up action of the '4-in-1' bucket quickly paid for its extra cost over the straight bucket. The ability to pick up and load large objects fast and efficiently without extra labor — such as debris, downed trees and stumps — meant a major saving in time and labor costs. We are also experiencing very good production and service on our regular work. It's the best all-around loader that I have ever used."

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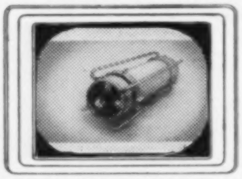

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1961. 505 pages. $11.75

RADIOACTIVE WASTES
Their Treatment and Disposal

Edited by J. C. Collins, *University of Manchester.* Examines in great detail the implications of radioactivity for water supply and waste water disposal, as well as the problems of disposing of radioactive solid wastes and radioactive gases themselves. **1961. In Press**

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(Continued from page 202)

change has taken place today that no one faintly considered 25 years ago. Then ask yourself if we really are more perceptive than those who made similar studies in the middle 1930's.

The book's value is in its scrutiny of conditions existing today. It offers the observation (then downgrades it as a cliche) that population growth follows economic growth. The author might have made one more perceptive observation that economic growth thrives best in a locality blessed with good, honest and progressive government supported by vigorous people dedicated to this government. There is much in this book of value to the small community. The New York Region, being so large, uncovers mistakes that would not be visible elsewhere and allows for their correction.

The book has one lesson that should be grasped by every metropolitan region. The suburban ring cannot remain "safe" from invasion by the heterogeneous mixture of peoples of varying colors, nationalities, and religions that first congregate in the central city. These people will not remain permanently in their so-called ghettos. They move out as they improve their economic position. For many, the task is harder than it was for similar groups that previously made the move. But they are going nonetheless.

While the author cannot say what 1985 will be, we can take comfort in his belief that there will be one.

Builder

Build For Tomorrow—*By Harry Steele Price, Sr. The Price Brothers Company, Dayton, Ohio.* 1960. 162*pp.*

A heart-warming easy-to-read autobiography of Harry Steele Price, founder of Price Brothers Company, formerly a construction firm and now a manufacturer of prestressed concrete pressure pipe, sewer and culvert pipe, Flexicore floor and roof slabs, etc.

Anyone with even a casual contact with the construction field and who is interested in a well-told story of what one individual can do in a very constructive manner will relish this account of one of the men who helped build our nation.

Tax Assessment Procedure

Proceedings of the Fourteenth Annual Short Course for Assessing Officers—*Institute of Public Administration, the University of Michigan, Ann Arbor, Mich.* 1960. 186*pp.* $1.

A good, practical and inexpensive text covering an area in local government where good authoritative guidance often is lacking. The papers include such practical headings as: appraisal of a bowling alley; appraisal of a house for assessment purposes; commercial and factory appraisal; personal property appraisal and many others.

State Constitutions

State Constitutional Revision — *By W. Brooke Graves, Editor. Public Administration Service, 1313 East 60th St., Chicago 37, Ill.* 1960. 306*pp.* $6.50.

Since cities are "creatures of the state," and since an uncomfortable number of states consider the cities creatures to be exploited, rather than supported, this is a good book for the serious-minded city official to have handy.

Most state constitutions need revision. But these badly needed changes won't come into being without an effort on the part of the cities involved. This text will go far in helping make those efforts constructive. It reports that for half-a-century, authorities, starting with Elihu Root, warned that states' rights mean nothing without recognition of states' responsibilities. It starts with a truly revealing introduction about myth and reality in state constitutional development, showing among other things, that states are being relentlessly overwhelmed with federalism. It tells how to change constitutions; change by interpretation is particularly fascinating. It describes constitutional conventions in the older states. It goes into substantial detail describing the constitutions developed by Alaska, Hawaii, and Puerto Rico, all especially enlightened. It analyzes what a state constitution should have in detail, giving a rather complete section on local government.

In all, it discusses a topic that will become more sensitive as this half-century of urbanism continues its growth.

Metropolitan Areas

Metropolitan Area Problems—*Bureau of Public Administration. University of California Press, Berkeley 4, Calif.* 1960. 249 *pp.* $2.50.

This is a compilation of papers delivered at a Pacific Coast conference on metropolitan problems. These conferences, we must say sadly, become just a little monotonous. If one wished, he could anticipate the proceedings. Always someone asserts breathlessly that cities are becoming obsolete (they certainly aren't), that automatic development processes fail (many times they succeed brilliantly) and the public cries for a new level of government (it does not!).

Someday, someone will get himself a

(Continued on page 207)

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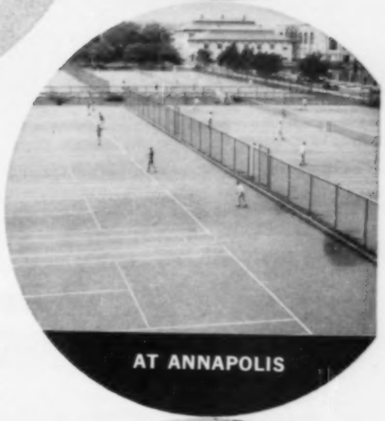

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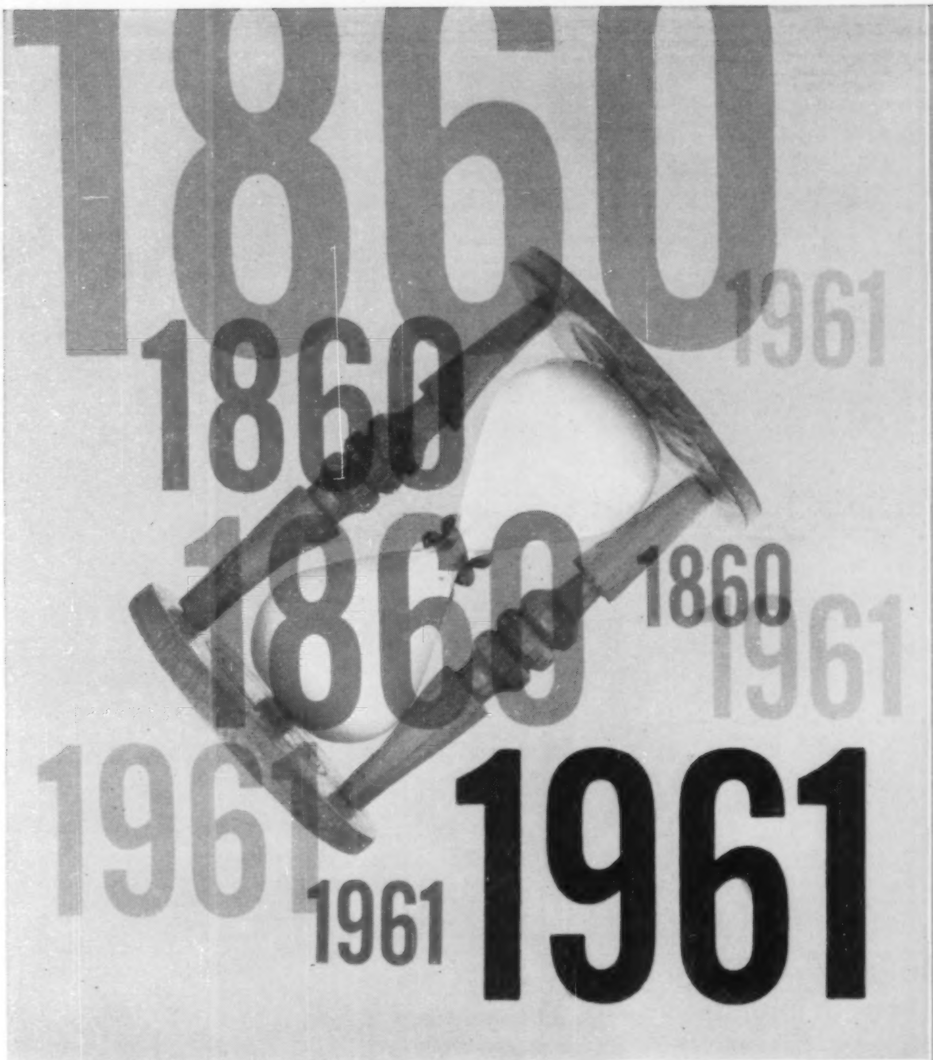

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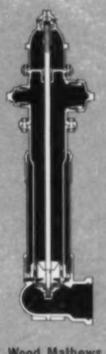

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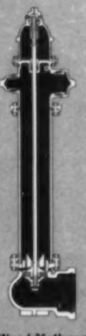

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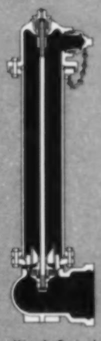

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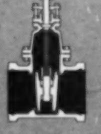

R. D. Wood Gate Valve—bury it and forget it.

(Continued from page 205)

shiny new doctor's degree at some university by "discovering" that what the people would like is a unit of local government that they can comprehend, and that they feel is aware of their existence. This doctoral discussion will also disclose that the people do endorse regional type activities dedicated to an understandable purpose, such as water supply, transit, air pollution abatement, but do not want this regional activity to be without some supervision by the leaders whom they select.

Industry Analysis

AN INDUSTRIAL SURVEY OF BERGEN COUNTY: PART 1—*County Planning Board, County of Bergen, Hackensack, N. J.* 1960. 34 *pp.* $2.

Another county that once was primarily residential sets its cap for industry—especially that which does not create nuisances and has high wage and salary levels.

Highway vs. Cities

URBAN RESEARCH 1960, BULLETIN 256—*Highway Research Board,* 2101 *Constitution Ave., N. W., Washington* 25, *D. C.* 1960. 29*pp.* 80 *cents.*

The Highway Research Board gives further counsel to road builders, telling them that there is a good deal more to their profession than concrete or asphalt.

One paper in this bulletin urges the controversial purchase of development rights for open space. We in this office look with some caution on open-space reservation that denies such space to public use.

Another analyzes urban expansion and traffic generation, and urges use of zoning to prevent "undue" concentration of population. Still another tries to tell how the behavioral sciences can contribute to better highway planning. Another—prepared by city planners—tells what Washington, D. C., is going to do about its transportation problem.

Loudness Levels

HANDBOOK OF NOISE MEASUREMENT—FOURTH EDITION. *General Radio Co., West Concord, Mass.* 132*pp.* $1.

Authored by A. P. G. Peterson and E. E. Gross of the General Radio engineering staff, this book contains much information in acoustic measurements. This includes a survey of the decibel, loudness levels, speech interference, hearing damage and neighborhood reaction to noise. Four appendices include decibel conversion tables, vibration charts, definitions and extensive references.

City Planning

PLANNING 1960. *American Society of Planning Officials,* 1313 *East 60th St., Chicago 37, Ill.* 1960. 210*pp.* $5.

Worth its price, if only to read Sir Frederic Osborn's contribution, "The Conqueror City." Sir Frederic has been stimulating the urban field for more years than one likes to count. And the Old Pro produces again in delightful style.

The book itself is a compilation of papers delivered at the recent meeting of the American Society of Planning Officials. Whatever one may say about planners, one will have to acknowledge that their writings are the most lucid and easiest to read of any professional group. Their sense of

(Continued on page 209)

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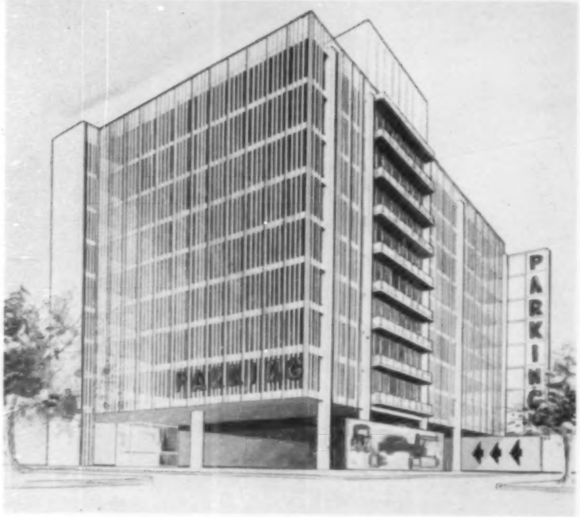

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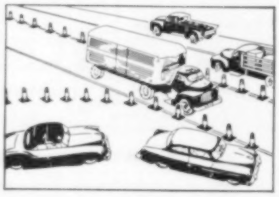

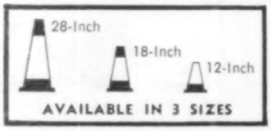

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(Continued from page 207)

humor, coupled with their ability to perceive basic facts, oftentimes is unnerving. In this book, one learns that we as a nation spend $3,000 annually per farm family to upgrade agriculture; but we spend with great reluctance only $84 per slum family to get rid of this damaging blight to a society of free people.

We learn also that the great "population explosion" started in 1940 with the law granting draft deferrment to fathers!

Said one of the acreage zoning, "Ivy League Socialism." Observed another, "To kill a man is murder. To kill a city is economy."

It is a dandy book not only for reference, but also for source material when giving a talk before the League of Women Voters. It wheels handily through everything from national planning in United States, Latin America, and Canada, to gasoline service stations. It talks of zoning, industrial development, urban renewal, water-front development, the aged, human values.

Air Pollution

Section I; Air Pollution—*U. S. Department of Health, Education and Welfare, Robert A. Taft Sanitary Engineering Center, Cincinnati 26, Ohio.* 1960. 25pp.

A list of publications on this sensitive phase of urban sanitation all prepared by and available from the Robert A. Taft Sanitary Engineering Center.

ADMINISTRATION AND GOVERNMENT

General—Capital Improvement Programs; Report No. 144. University of Washington Press, Seattle 5, Wash. 1960. 41pp. $1. The theme of this publication is "Planning—Key to Fiscal Control and Economy."

West Virginia—Public Relations for West Virginia Municipalities; Publication No. 29. By Paul E. Kidd. Bureau for Government Research, West Virginia Univ., Morgantown, W. Va. 1960. 28pp.

CIVIL DEFENSE

General—Fallout Shelter Surveys: Guide for Architects and Engineers. Director, Publications Office, OCDM Operational Headquarters, Battle Creek, Mich. 1960. 52pp.

FINANCE AND TAXATION

Connecticut — Handbook for Connecticut Boards of Tax Review. By Rosaline Levenson. Institute of Public Service, the University of Connecticut, Storrs, Conn. 1960. 46pp. $1.

LEGAL

Washington — Legal Notes; Information Bulletin No. 218. Association of Washington Cities, 250 Smith Hall, University of Washington, Seattle 5, Wash. 1960. 74 pp.

PLANNING, ZONING AND HOUSING

Chester Township, N. J.—A Comprehensive Development Plan. Herbert H. Smith Associates, P. O. Box 206, West Trenton, N. J. 1960. 32pp.

Clifton, N. J.—Zoning for High Rise Apartments. Clifton Planning Board, City Hall, Clifton, N. J. 1960. 52pp.

Columbia, Ala.—Long Range Land Use Plan. Columbia Town Planning Commission, Alabama State Planning and Industrial Development Board, Columbia, Ala. 1960. 31pp.

Elmira, N. Y.—Future Development Patterns. Herbert H. Smith Associates, P. O. Box 206, West Trenton, N. J. 1960. 68 pp. $5.

Gloucester County, N. J.—Future Development Plan. Herbert H. Smith Associates, P. O. Box 206, West Trenton, N. J. 1960. 19pp.

Illinois—Public Works Planning and Development in Illinois. By Jerome L. Kaufman. Bureau of Community Planning, University of Illinois, Urbana, Ill. 1961. 30pp. $1.

New York State—An Action Program for Community Development. New York State Division of Housing, 270 Broadway, New York 7, N. Y. 1960. 32 pp.

Tacoma, Wash.—Basic Planning Studies. City Planning Commission, Municipal Building, Tacoma, Wash. 1960. 25pp. $1.

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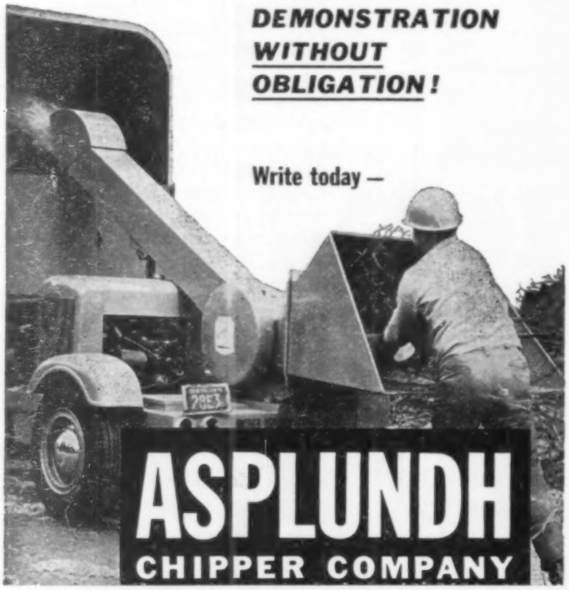

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GO-JO'S HEAVY DUTY DISPENSER CONTROLS WASH-UPS ... SAVES YOU MONEY!

Designed to eliminate waste, the Go-Jo Heavy Duty Dispenser delivers just the right amount of Go-Jo to get even the grimiest hands spotlessly clean. Go-Jo Creme Hand Cleaner is a concentrated formula containing GT-7 for dermatitis protection, plus soothing emollients to prevent chapping. When used in the Heavy Duty Dispenser, it provides four times as many clean-ups as "hand scoop" methods.

Pat. No. RE. 24312

The Go-Jo jobber serving your area will be happy to show you how to cut as much as 75% off your hand-cleaning expenditures.

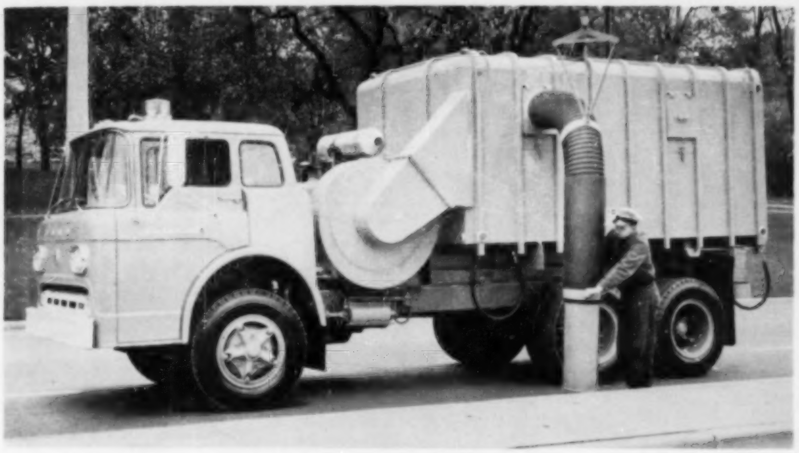
WRITE US TODAY.

2612

GOJER, INC.

Box 991 Akron 9, Ohio

MANUFACTURERS OF go·jo PRODUCTS

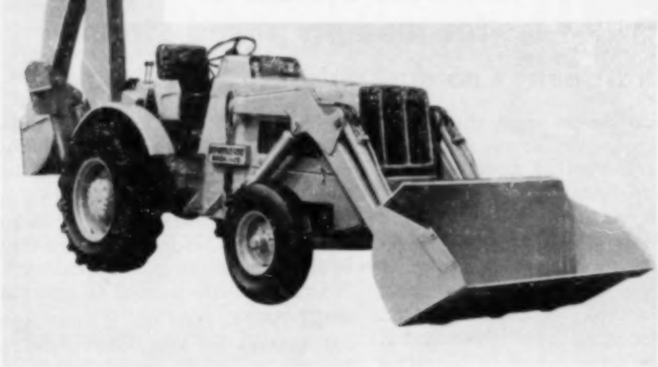


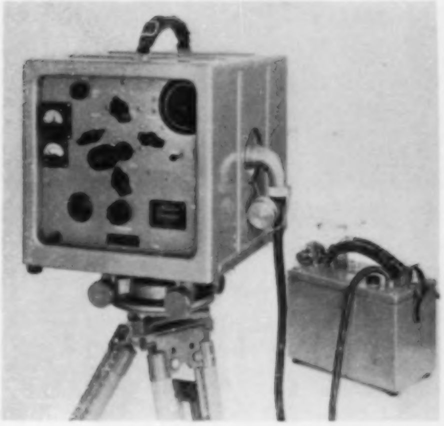
Street cleaner

picks up and hauls street and highway debris, street sweepings, stones, sand, bottles, cans. As a catchbasin cleaner, it removes catchbasin muck, gravel, rock, sand and stone. The 16-cubic-yard enclosed body of Vac-All Model E-5 is built for hauling heavy materials. Debris enters without passing through the blower. The high-pressure blower maintains high vacuum. For dumping the load, a heavy-duty hydraulic hoist is used. For details, write The Central Engineering Co., Inc., 4429 W. State St., Milwaukee 8, Wis.

New type of loader-tractor-backhoe

has been engineered as a completely integrated unit and introduced by The Hy-Dynamic Co., Lake Bluff, Ill. "Dynahoe" features include an extra-heavy frame, which provides necessary stamina and strength, extremely heavy-duty buckets, booms, dipper, and other components. Struck capacity on the backhoe is 7.5 feet; on the loader, ⅞ cubic yard.



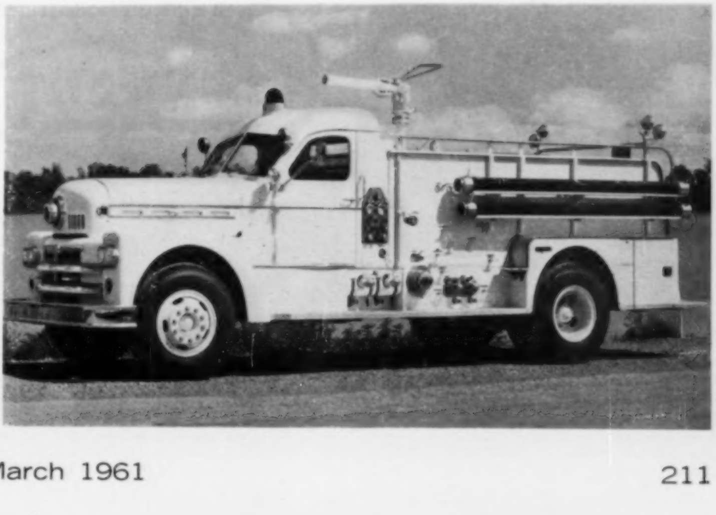


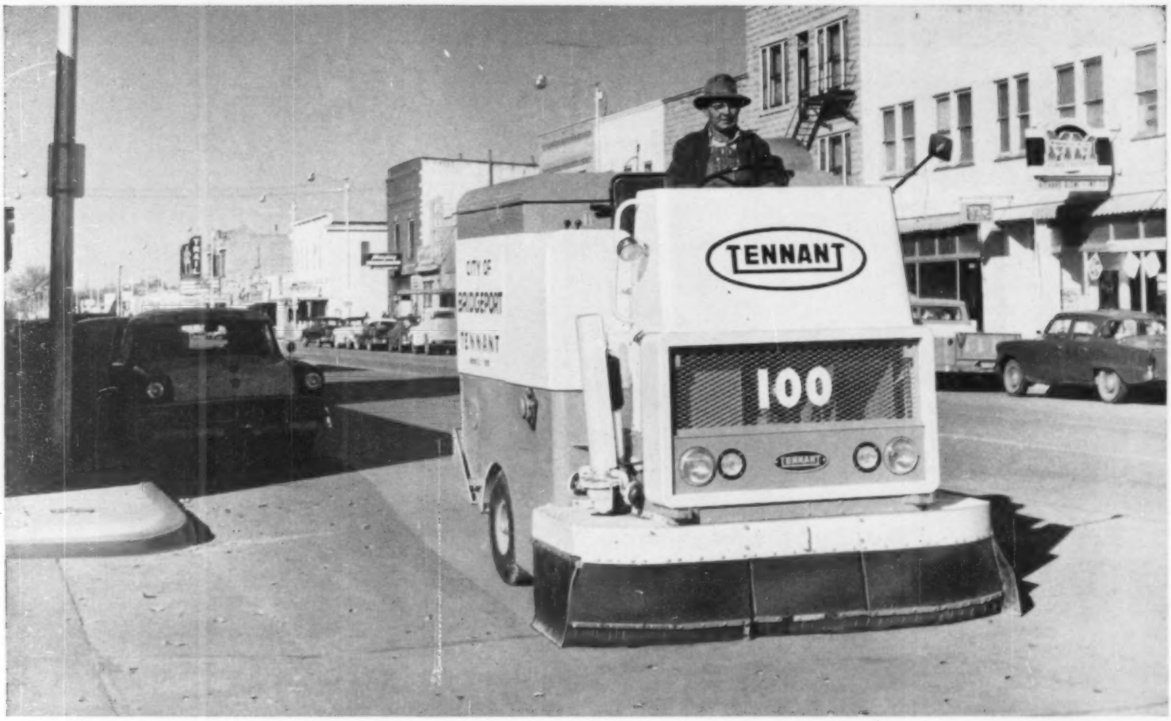
Improvements in model 4B

electronic distance measuring instrument, have resulted in a 25% reduction in pointing time over previous models, 20% less weight, improved readability, faster observation, longer operating range. Interested city engineers may write to Geodimeter Div., AGA Corporation of America, 2013 Park Ave., South Plainfield, N. J.

Combination foam unit

. . . and standard pumping engine incorporates a standard volume fire pump with standard hose body arrangement, yet has a separate foam pump which supplies foam to discharge outlets through separate flow controllers. Thus, foam and water can be provided in any combination of these discharges. In service in New Haven, Conn., this unit can be run as a standard engine and can be used for foam duty involving flammable liquids. Foam tank holds 400 gallons; water tank, 600 gallons. Write The Seagrave Corp., 2000 S. High St., Columbus, Ohio.





NEW PAVEMENT LOOKS ITS BEST when "vacuum-swept" with the maneuverable Tennant "100."

SWEPT AS CLEAN AS YOUR OFFICE FLOOR. Tennant's huge 540-square-foot filter captures virtually *all* the dirt . . . even particles as fine as 5 microns, far smaller than the human eye can see. The Tennant "100" sets a new cleaning standard.

FOR MORE CONGESTED AREAS such as parking lots, airport ramps, driveways, walks, arenas, the Tennant Model 80 vacuumized sweeper is ideal. Starts, stops and reverses instantly; turns in a 65" radius. Cleans a 53" path; sweeps over 100,000 square feet per hour in open areas.

NEW! TENNANT system of sweeping for modern paved streets

• ultra-clean • no dust nuisance • easy to use

If you have new pavement, there's no cleaner, easier way to sweep it than by the *new* system developed by TENNANT—"*precision*" *vacuumized sweeping*—expressly designed for towns where cleanliness counts most.

Cleans in 1 pass. Engineered to meet new sweeping standards, a TENNANT Sweeper actually *lifts* the dirt, even from crevices and pores in pavement.

No dust, no water—*another first!* The brooms are vacuum-enclosed for ultra-clean work on modern streets. Ends complaints of usual dust nuisance. Cannot be compared with any other street sweeping system.

Easy to use. Short (10′2″) turning radius gives unmatched maneuvering ease . . . allows economical sweeping of areas usually requiring hand work. No special skills needed to operate.

WRITE TODAY. *Find out if your town can qualify for this NEW kind of sweeping*—with its many advantages. G. H. Tennant Co. 751C N. Lilac Drive, Minneapolis 22, Minnesota.

TENNANT VACUUMIZED SWEEPERS

and other specialized maintenance equipment

Power Sweepers

Traffic Line Erasers

Concrete Routers

Aid in Planning Waterfront Installations

Standard Steel Products Mfg. Co., a leading manufacturer of all-steel marina components, announces a free engineering consultation for public and private developers of marina installations. The service will aid in planning the most economical and most serviceable dock facilities to meet boat parking needs.

Standard Steel Marina components are interchangeable and can be arranged in a wide range of slip patterns. Factory fabrication provides quick, easy, on-site assembly. Included in the line are prefabricated interchangeable floating dock components, motorized approach ramps, self-adjusting stairways, colorful aluminum slip canopies, slip dividers, boat bumpers and tie-down cleats.

The firm's steel and rust-resistant piers are easy to maintain and feature a non-skid deck paint. Telescoping supports make possible installation on irregular terrain and pontoon floating docks allow installations in fluctuating, deep water or on soft bottom.

The piers are available in sizes, designs and shapes to fit every pier need. Unit construction permits enlargement of the pier by addition of units. Accessories available include steps, ladders, diving boards, boat lifts and mooring arms.

For additional information, write STANDARD STEEL PRODUCTS MFG. CO., INC., 2836 S. 16TH ST., MILWAUKEE,

Precise Engineer's Level

The Wild N-2 level is designed for efficiency, accuracy and convenience in general engineering work. An exclusive feature is the telescope, which together with the level vial assembly, can be rotated about the optical axis for checking level adjustments quickly.

Other features include 24 or 28-power telescope with coated lenses, internal focusing, clamp and tangent screw, tilting screw with leverage, and coincidence-reading tubular level. Booklet N-2 contains complete information; for a copy, write WILD HEERBRUGG INSTRUMENTS, INC., PORT WASHINGTON, N. Y.

Chemical Solution Feed Pump

A new electric feeder, designed to introduce small amounts of chemical solution into a water system, has been introduced by Bruner Corp. of Milwaukee, Wis.

The feeder can be used to provide chemical treatment for water and sewage purification, boiler feed

(Continued on page 215)

GUARD-GATE
PATENTED

WEIGHT
APPROX.
20 LBS.
36"
HIGH
OPEN

expansion SAFETY BARRICADE

THOUSANDS IN USE nationwide by highway, police and fire departments, by contractors, industrial plants and military establishments.

GUARD-GATE is a practical, all-steel safety barricade that instantly extends to full length, yet collapses to just inches for easy storage. Comes complete with basic mountings for flasher warning lights, flares and signs.

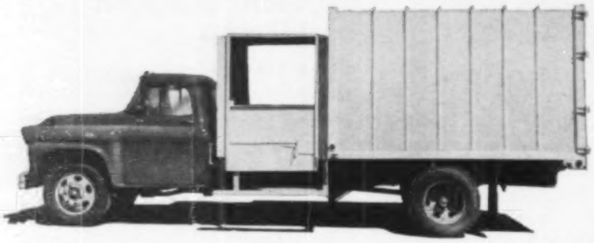
Glass-beaded reflectorization on traffic-yellow cross bars gives maximum night time visibility. Fibre board box serves as carrying case.

COLLAPSES COMPACTLY FOR STORAGE

AVAILABLE
IN 4, 6 and 8 FT. MODELS
AT SAFETY DEALERS and
HIGHWAY EQUIPMENT
DISTRIBUTORS

WEST SIDE IRON WORKS, Inc.
327 FRONT AVE., N.W.
GRAND RAPIDS 4, MICH., USA

Two Low-Cost Ways to Get a Cleaner Community



LEAF-VAC BAUGHMAN LEAF SWEEPER

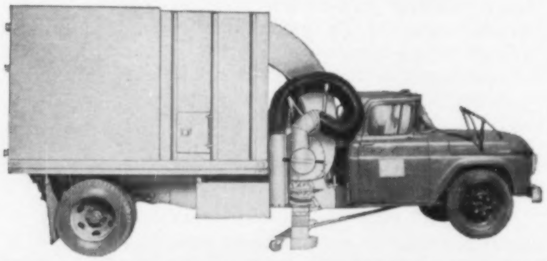
The modern vacuum-action method for cleaning leaves from streets and gutters.

Leaf-Vac Leaf Sweeper does efficient leaf and twig collecting through powerful vacuum suction, has auxiliary engine to power blower. A 12-foot hose attachment cleans catchbasins and the curb-to-sidewalk area. Collects full 5-foot swath without raising dust; vapor spray keeps dust down while loading and unloading. Dumps automatically. Three body sizes.

RAM-PAK BAUGHMAN REFUSE TRUCK

The self-packing, self-unloading refuse body with many exclusive features:

Ram-Pak Refuse Truck has self-packing feature that permits more rubbish collecting before dumping is necessary. Load from both sides, has large crew ramps. Water tight body. Dumps automatically with powerful twin ram hoists. Two body sizes. Write for Leaf-Vac Bulletin A-457 . . . Ram-Pak Bulletin A-433-A.



Better service through better engineering. Parts and service from 200 distributors

BAUGHMAN MANUFACTURING COMPANY, INC.

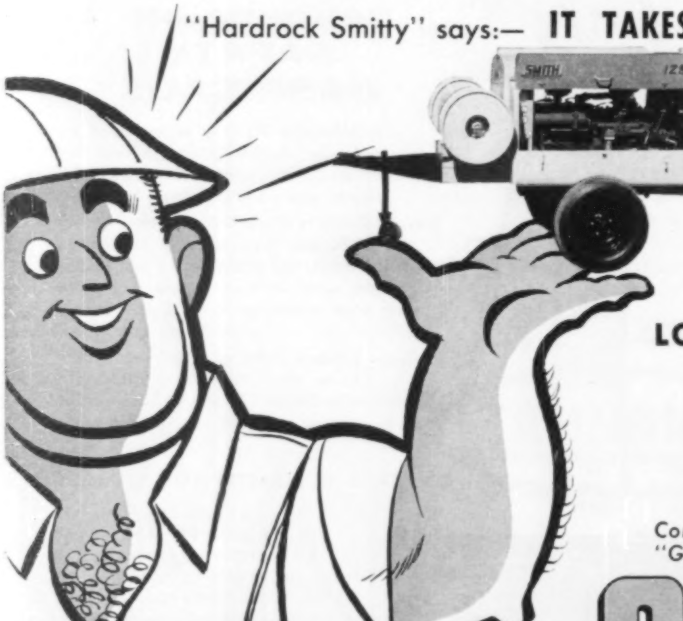
TRANSPORTS·SPREADERS·CONVEYORS

307 SHIPMAN ROAD • JERSEYVILLE, ILLINOIS

6039

"A few choice distributorships available"

"Hardrock Smitty" says:— **IT TAKES A SMITH 125 AIR COMPRESSOR TO DELIVER ON THE TOUGH JOBS . . .**



Built to "take it" when the going get tough, the Smith 125 Air Compressor will give you years of low cost, dependable service. The Rugged Hercules Industrial engine delivers over 125 c.f.m. hour after hour, day in and day out.

LOOK AT THESE FEATURES:

- **low initial cost**
- **low operating cost**
- **easy maintenance**
- **simple, compact design**
- **12 volt electrical system**
- **125 c.f.m. at 1165 rpm**
- **operates two 85 lb. paving breakers at same time**

Compare price . . . compare job results—you'll "Go Smith" with "Hardrock Smitty"!

SMITH AIR COMPRESSORS

There's also a complete line of Smith Air Compressors in 45 cfm and 75 cfm models, both portable and stationary.

Ask your dealer for an "on the job" demonstration. (write us for complete information and the name of your nearest dealer.)

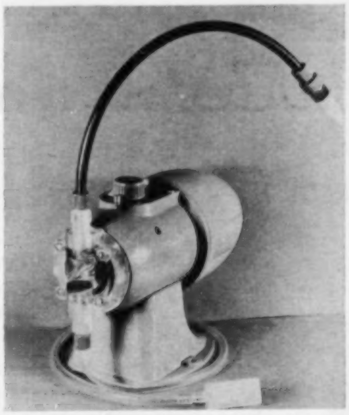
GORDON SMITH & COMPANY, INC., Bowling Green, Ky.

(Continued from page 213)

water, and swimming pools. Specific applications include chlorinating, correcting red water problems, preventing costly scale formation, neutralizing acid water, and controlling hydrogen sulfide odor problems.

Feed rate is adjustable from 2.4 to 20 gallons per day by means of a fingertip control knob. Positive treatment is assured at any pressure from suction to 100 psi pressure. No external anti-siphon valve is required. Chemical head, connectors and body of the Model 20 pump are made of high impact plastic.

For additional information, write Bruner Corp., 4767 N. 32nd St., Milwaukee, Wis.



Model 20 chemical solution feed pump will operate outdoors in rain and snow.

Extrudes High Curbs without Use of Forms

An automatic curbing machine, called the High Curber, lays portland cement concrete or asphalt curbs from 12 to 24 inches high. Twelve inches was the maximum height of extruded curbs prior to the introduction of this new machine, which has two or more compaction augers. No forms are necessary as the curb assumes final form as it is extruded from the machine.

High Curber uses a relatively dry or stiff concrete mix at zero slump. Sides of the curb can be vertical and as much as 24 inches high. In addition to forming the typical deep curbs, the machine can be used to extrude concrete crash barriers as wide as 18 inches on the base.

Speed of the machine is 3 to 5 feet per minute, depending on the size of the curb. To insure true grade and line of the finished product, when it is laid on a rough sub-base, a simple-to-lay angle iron track is used.

Adjustments in the machine allow it to negotiate contours, move up or down grade, and turn radii down to 12 feet. It is powered by a Wisconsin Model AGND Engine developing 12.2 hp at 3200 rpm.

The High Curber is Power Curber's Model 700, manufactured by Power Curbers, Inc., Salisbury, N. C.

High Curber Model 700 extrudes concrete curb 16 inches high at Beaverton, Ore. The concrete mix is at zero slump with stone under $\frac{3}{4}$ inch. The curbing machine moves on single angle iron track when laying on sub-grade.

Manufacturers Organize

Formation of the Process Equipment Manufacturers Association with offices at 551 Fifth Ave., Room 1412, New York 17, N. Y. was announced following the first annual meeting held recently at the Harvard Club, New York. One of its principal purposes is to assist its member companies in improving the efficiency of their operations and thereby rendering increased services to their customers.

J. D. Hitch, Jr., Director of Dorr Oliver Inc., is president, and Harlowe Hardinge, President of Hardinge Co., is vice-president. R. P. Kite is executive secretary-treasurer.

The Executive Committee is com-

(Continued on page 217)

When there's a long, lawn trail a-winding . . . get

Simplicity

'700'

7 HP RIDING TRACTOR

Patented "Free-Floating" Mower Action Won't Scalp . . . Won't Scrape!

Velvet-smooth lawns? Simplicity's '700' Riding Tractor delivers them season after season! Three-gang mower mows $2\frac{3}{4}$ acres per hour . . . new 42" Rotary Mower follows ground contours, can't scalp, cuts within $\frac{5}{8}$" of obstructions.

Ground-gripping stability, single-pedal clutch and brake control, convenient gear shift lever, 3 forward speeds and reverse . . . quick-change attachments for clearing snow, cutting weeds, many other jobs!

NEW '700' ATTACHMENTS FOR 1961!

46" SICKLE BAR—cuts at any angle to 30° *below* horizontal!
36" SNO-THROW—clears deep drifts quickly from walks, drives!
42" ROTARY MOWER—big-volume mower, takes 40% slopes easily!
110 Volt, 1500 Watt Mobile Generator—brings electric power to the job!

World's Most Advanced Riding Tractor

SIMPLICITY MANUFACTURING CO.
6157 Spring St., Port Washington, Wisconsin
makers of Wonder Boy Riding Mowers, Roticul Tiller-Cultivators, Simplicity Garden Tractors

CUT STREET-SWEEPING COSTS

WITH *Wynene® 18* **POLYOLEFIN BROOM FILLER**

AN ESPECIALLY ENGINEERED FILLER FOR ROTARY STREET-SWEEPING BROOMS

It takes nothing short of the rugged qualities of WYNENE 18 broom filler to do a thorough job of keeping city streets clean. These filaments are "torture-tested" day after day in the performance of their natural duties. In tests like these, WYNENE 18 proves its superiority — its resistance to constant abrasion, to most chemicals, its low moisture absorption, its greater flexibility — features that make it the unquestionable choice for street-sweeping brooms. Specifications .075 x 105 x 26" in Natural.

FOR COMPLETE FACTS, WRITE TO THE DISTRIBUTORS:
FREDERICK H. CONE & COMPANY, INC.
181 FRONT STREET • NEW YORK 38, N.Y.

MANUFACTURERS:
THE NATIONAL PLASTIC PRODUCTS COMPANY
Saran and Nylon Fibers—Nevamar High-Pressure Laminates—Wynene Extruded and Molded Products
ODENTON, MD. • NEW YORK, N. Y. • MIAMI, FLA. • CHICAGO, ILL.
DENVER, COLO. • PORTLAND, ORE. • LONG BEACH, CALIF. • SAN FRANCISCO, CALIF.

Your Problem:

ROAD CONDITIONING

Your Answer:

The GOOD ROADS "HANDY" SPREADER

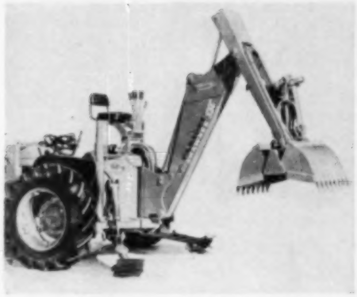
Available in 6 sizes, this versatile unit spreads aggregate from powder-fine carpet to 3" depth. Write today for illustrated brochure.

Good Roads GOOD ROADS MACHINERY CORPORATION
MINERVA, OHIO

(Continued from page 215)

posed of: Calvin A. King, President, Bird Machine Co.; P. H. Mulcahy, Mgr., Wemco Div., Western Machinery Co.; Harold M. Soars, President, Sprout, Waldron & Co.; A. L. Bolton Jr., Treasurer, John W. Bolton & Sons; A. J. Chubb, Gen. Mgr., Raymond Div., Combustion Engineering, Inc.; H. J. Douglas, Gen. Mgr., Pennsylvania Crusher Div., Bath Iron Works; H. I. Edwards, Vice Pres., Pfaudler-Permutit, Inc.; Milton Spiegel, Gen. Mgr., Chicago Pump Div., Food Machinery and Chem. Corp.; E. C. Swift, President, The Sharples Corporation.

Clamshell Backhoe Attachment



A new backhoe attachment for utility tractors designed specifically for spot excavations and digging graves has been announced by the Parsons Co., manufacturer of trenching machines and utility tractor attachments.

It is called the Hydro-Clam 88C and is available with 24, 30 and 36-inch wide buckets, features 10,000-pound breakout, 3,000-pound lift capacity, 12-foot digging depth, and 9¾-foot dumping height.

The unit's bowls operate independently or together to produce smooth, clean sides and level floor. Tremendous breakout pressure of clam bowls produces square corners.

PARSONS COMPANY, NEWTON, IA., states that the entire clam assembly can be attached or detached from the boom in just minutes.

Mercury Lamp Manual

This new 28-page technical booklet contains the latest information on mercury lamps including light output, life ratings and characteristics. For street lighting, low wattage lamps are now being used in increasing numbers for residential and secondary street lighting. High wattage mercury lamps are for main streets. Colortone high output white lamps are finding wide application because of 10-15% additional light output as compared to clear mercury lamps. The net result is usually a slight overall gain in footcandles together with a considerable improvement in color.

The three groups of mercury lamps for street and flood-lighting are: (1) the low wattage group, consisting of 100, 175, and 250-watt lamps; (2) the popular 400 and 425-watt group; (3) the high wattage group, consisting of 700 and 1,000-watt lamps.

For a copy, write WESTINGHOUSE ELECTRIC CORP., LAMP DIVISION, BLOOMFIELD, N. J.

Rotary Air Compressor Has More Horsepower

The new Le Roi 125-cfm rotary portable air compressor is powered by a Le Roi D226 wet sleeve engine; the larger displacement of this engine over the former unit provides a 15% increase of horsepower. The 53-hp engine provides 60% power surplus. Features of the engine include stellite exhaust valves and valve seat inserts and valve rotators. At 1600 rpm, this slow-turning engine reduces both engine and compressor parts wear.

(Continued on page 219)

The new Le Roi 125RG2, with a dry weight of 2190 pounds, is still the lightest compressor in its class.

NCG® wherever emergency strikes...

*Handy** Resuscitators automatically breathe when the breath of life is gone.

The Handy Resuscitator does *three* important things:

1. It automatically inhales and exhales, adjusting automatically the depth of respiration to the patient's lung capacity, for an adult, child or even *infant*.
2. It can be quickly switched to "Inhalation" to supply oxygen to be absorbed by the spontaneous respiration of the patient.
3. It provides sufficient suction as an Aspirator to remove obstructing material from the throat, such as water, mucus, etc.

"BE PREPARED"
for drownings,
carbon monoxide
poisonings, heart attacks,
electric shock,
strangulation, asthma,
asphyxia of
the new-born.

Get complete information today.
Phone or write now.

NATIONAL CYLINDER GAS
DIVISION OF CHEMETRON CORPORATION
840 North Michigan Avenue, Dept. 10-C
Chicago 11, Illinois

CHEMETRON

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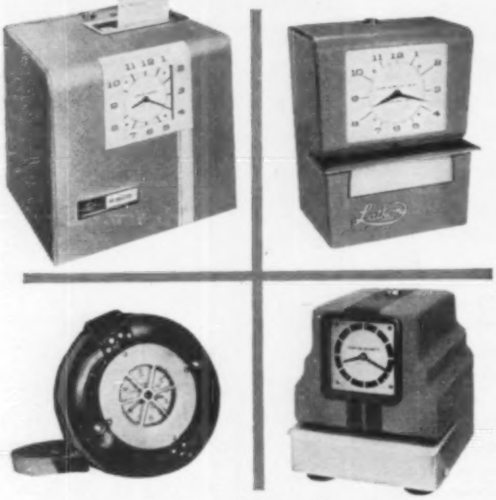
*Trademark

time. . . *city managements' greatest single cost factor!*



control it effectively with Lathem

PAYROLL RECORDERS
JOB TIME RECORDERS
TIME STAMPS
WATCHMAN CLOCKS

You can eliminate time leaks and increase the efficiency of all departments with a Lathem machine. Precision-built for a long life of care-free service, Lathem machines are designed and engineered to meet all of your time recording needs with absolute accuracy and maximum speed.

There is a Lathem machine for (1) payrolls, (2) parking lots, (3) garages, (4) public buildings and watchmen's rounds, (5) dating and numbering papers, (6) mail arrival, (7) booking and releasing prisoners, (8) records of sequence handling, and (9) entry of important records and deeds as well as many other activities where an accurate time record is essential.

Write, wire or call for complete information.

LATHEM TIME RECORDER COMPANY

92 Third Street, N. W., Atlanta, Georgia

GENTLEMEN: Without obligation, please send me full information about Lathem time equipment, including prices.

NAME____________________

POSITION____________________

STREET____________________

CITY____________ZONE____STATE________

WOOD'S

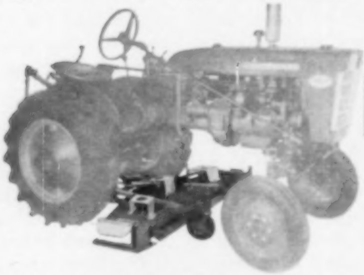
Hi Speed

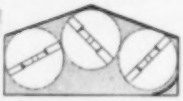
ROTARY MOWERS

Wood's Model 80 Triple Blade — Cut 6⅔' swath

built to do the job!

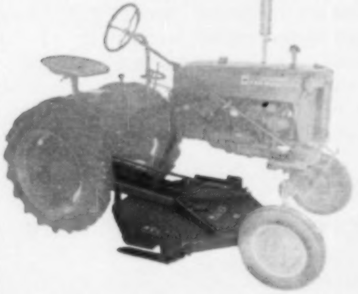
Wood's Rotaries offer a choice of swath widths from 3½' up to a giant 9½' that cover 6 acres per hour. Not only is the job fast, it's smooth and even. The savings in reduced grounds maintenance cost soon pays for the machine many times.

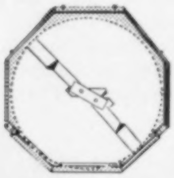




Triple blades cut clean 5' swath

Wood's Model 59 Lawn Special. Exclusive *floating* mount follows the contour of the lawn. Undermounted for excellent visability and maneuverability.





Single blade cuts full 3½' swath

Wood's Model 42 easily attaches to tractor with important built-in operator protection. Makes quick work of mowing, mulching and light brush cutting.

Write for free literature on the Wood's line and name of the nearest dealer.

WOOD BROTHERS MFG. CO.

54103 South 4th Street Oregon, Illinois

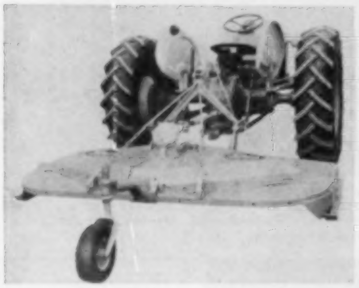
SPECIALISTS IN THE MANUFACTURING OF TRACTOR POWERED ROTARY MOWER SHREDDERS

(Continued from page 217)

Diesel and utility models of the new 125 rotary are also available and have the same features as the gasoline-powered unit, which has numerous features that are designed to reduce servicing costs.

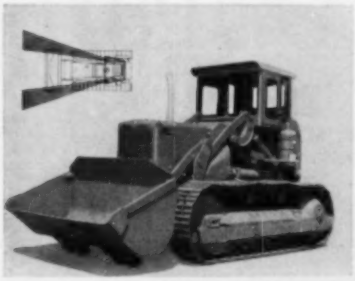
For additional information, write SALES PROMOTION DEPT., LE ROI DIVISION, WESTINGHOUSE AIR BRAKE COMPANY, SIDNEY, OHIO.

Clips Grass at a Clip



A new Model V-90 "Ranger" three-blade belt-driven pasture clipper has been introduced by SERVIS EQUIPMENT CO., BOX 1590, 1000 SINGLETON BLVD., DALLAS, TEXAS. It is said to cut cleaner, with less required power and with less investment per width of cut. A convertible type for either 3-point lift or pull-type operation, it is recommended for parkways, landing fields or similar type of operation.

Improved Field of Vision for Traxcavator Cabs



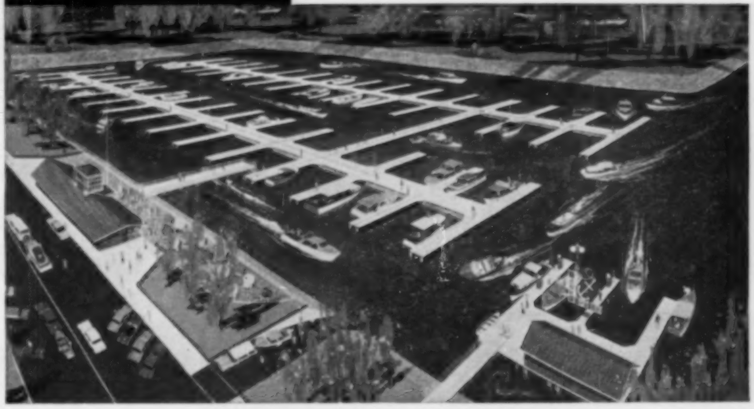
Newly designed Vu-All Cabs, developed by Crenlo, Inc. for use on Caterpillar Traxcavators are said to provide a 70% wider view of the operating area than conventional cabs. They are also said to incorporate features for greater operator safety and comfort.

Heavy glass windshields are tinted, shatter-proof and vertically mounted to minimize dust collection. A swinging rear window and doors can be held open for ventilation. An acoustical ceiling reduces noise level and insulates against cold and heat.

The manufacturer reports these cabs engineered to accommodate all combinations of hydraulic control valves without modification and easy to install on Traxcavators.

Crenlo's new Dust-Temp Air Washer, an evaporator cooler which filters air and holds cab temperature at a comfortable level, also adapts to Vu-All Cabs and gives the operator a dust-free atmosphere in which to work, a desirable feature when operating in sanitary land fills and in other dust-producing work. CRENLO, INC., 1600 FOURTH AVE., N. W., ROCHESTER, MINN., will supply details on request.

MODERN MARINAS by Standard Steel



Sure, Fast Way to a BOATING BOOM for Your Town!

FREE

Full-Color Brochure illustrates today's finest all-steel Marinas, with features and construction details, as well as photos of actual installation. Write for your copy today!

Your town, too, can prepare for boating leadership in *record time* with a modern Standard Steel Marina like this! Includes finest, latest designs in all-steel floating boat slips, colorful boat shelters, non-skid steel floating docks and access ramps, self-adjusting stairways, floating service patios and accessories . . . All pre-planned, engineered, and pre-fabricated for *fast* installation—ready for your boaters in *days* instead of months, lower in cost, yet promising years of safe service.

Start YOUR Marina planning NOW!
Term financing available.

Standard Steel PRODUCTS MFG. CO.

Dept. A, 2836 S. 16th Street, Milwaukee 15, Wis.
Branches: Paramus, N.J. — Detroit, Mich.
LEADERS IN ALL-STEEL WATERFRONT EQUIPMENT

CLIP THE COUPON FOR COMPLETE DETAILS

STANDARD STEEL PRODUCTS MFG. CO.
Dept. A, 2836 South 16th Street, Milwaukee 15, Wisconsin

We're interested in Modern Boating Marinas —

☐ Send FREE copy of new color brochure "MODERN MARINAS by STANDARD STEEL"

☐ Have your Marina Expert call on us for free consultation and planning aid.

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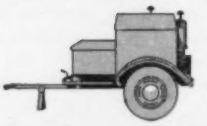
GIVE 'EM LINDSAY COMPACT AIR



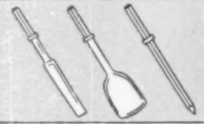
POWERFUL Runs one or two breakers

PORTABLE Trails behind light vehicle at auto speeds

COMPACT Easily moved on the job as needed

Lindsay compressors are the most portable, compact and powerful air compressors available for their capacity. The single unit, direct drive design results in the construction of rugged, compact machines easy to operate and maintain.

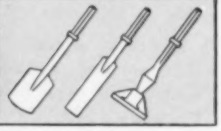
Mr. Edward E. Baker of Lee Electric, Brockton, Mass., says: "What I need is portability and flexibility, because my jobs are located all over southeastern Massachusetts. My two compact 80's are easy to trail and are reliable."



LINDSAY PORTABLE "Give 'Em Air!" AIR COMPRESSOR

P. K. LINDSAY CO., INC.

EVERETT, MASS. • DEERFIELD, N. H.



For all-'round deodorizing . . .

ROUNDS

Fragrant, laborless deodorant discs for urinals, bowls, garbage pails, lockers, closets

Deodoroma ROUNDS cost in use averages only a *fraction* of one cent a day. Rounds are formed under 70,000 pounds pressure: are dense and durable. Fragrance is locked in: lasts until the last particle has vaporized—there's no harsh "moth cake odor." Packed eight to the telescoping box—each Round sealed airtight—easy-to-shape Holzit wire holder in every box. For literature write to The C. B. Dolge Company, Westport, Conn.

For free sanitary survey of your premises ask your Dolge service man

Dependable DOLGE

WESTPORT, CONNECTICUT

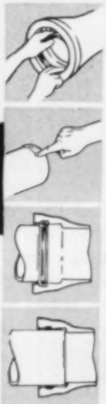
—for the BEST CONNECTION you'll ever make . . . specify

APCO ALTITE JOINTS

Underwriters Approved

Protected by Patent

The **ALTITE JOINT**, even under most extreme conditions, is so simple to install you could hardly go wrong if you tried!



Insert rubber gasket in bell end of pipe. You can't put it in wrong.

Lubricate lightly to reduce friction.

Insert plain beveled end — there are no grooves, ridges, or tips on gasket to interfere.

Small amount of pressure forces end to bottom of socket, completing the tight joint.

ALABAMA PIPE COMPANY

A Division of Woodward Iron Company

Phone AD 6-7601, ANNISTON, ALABAMA

We invite your inquiry at any sales office:

CHICAGO: 122 S. Michigan Avenue
NEW YORK: 350 Fifth Avenue
KANSAS CITY: Suite 950, 1006 Grand Ave.
DETROIT: 18505 W. Eight Mile Road
SOUTH GATE, Calif: 5335 Southern Ave.

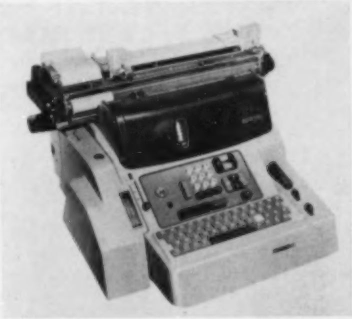
Underwood Data Processing

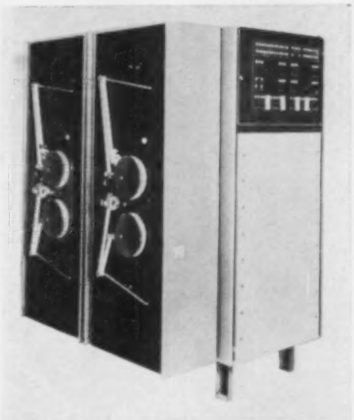
UNDERWOOD CORPORATION, ONE PARK AVE., NEW YORK 16, N. Y. is introducing a new line of data processing equipment for the preparation of original documents or to capture essential data in paper tape for further automatic processing.

The Underwood Data-Flo Tape to Card Converter complements the accounting machine by providing a means of producing punched cards from the paper type. Cable connected and fully synchronized with a Summary Punch, the Converter produces 80 column cards at 6,000 to 7,200 per hour depending on type of punch.

The Underwood Data-Flo Tape to Magnetic Tape Converter satisfies the conversion needs of those organizations employing magnetic tape instead of punched cards.

These products are the forerunners of other Underwood data processing machines scheduled to reach this market in the near future. The Data-Flo accounting machine and tape card converter are shown at the right.



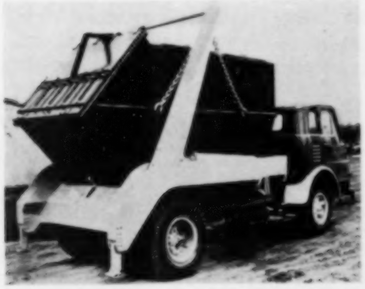


Heil Expands Product Line

Acquisition of the materials handling equipment business of the Ingersoll-Kalamazoo Division of Borg-Warner Corp. by THE HEIL CO. of MILWAUKEE 1, WIS. has been announced by Joseph F. Heil, president of the Heil organization.

Machinery and fixtures used in the production of the materials handling equipment will be moved from Kalamazoo, Mich. to Heil's main plant in Milwaukee and will be op-

(Continued on page 223)



The Load Lugger unit and removable dump body, basic models in the material handling equipment line sold by Borg-Warner to The Heil Co., is made in several sizes and capacities and comes with a variety of body styles.

PROVEN PERFORMANCE

- Criminal apprehension and investigation

The apprehension of criminals in our modern day system of control is one of a complex nature. The "EL-TEC" method of electronic emergency control of traffic signals affords the investigating officer the advantage of predetermining the actions of the person under surveillance without alarming the suspect. Actuation of a signal from a control vehicle places your department "one step ahead" of the fleeing criminal.

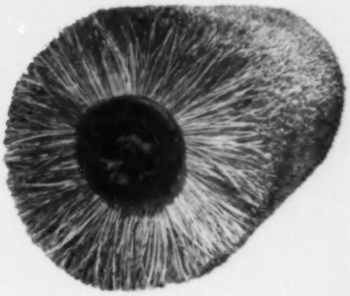
Write today for information regarding EL-TEC's use in:

- Criminal apprehension and investigation
- Roving police traffic aid
- Sign and siren control
- Integration of complete traffic control
- Railroad signal crossing control
- Emergency vehicle traffic control
- Civil defense evacuation and disaster aid
- Aid in safety education program

EL-TEC

97-AC Northfield Road • West Orange, N.J.

FIBRES



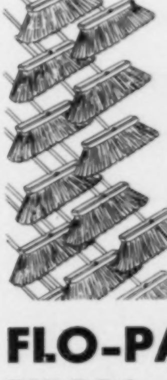
for your
STREET SWEEPER BROOMS

Shipped immediately from
New York—Minneapolis—Los Angeles

☐ FLAT STEEL WIRE
☐ PALMYRA STALKS
☐ AFRICAN BASS
☐ SPLIT HICKORY
☐ POLYPROPYLENE FIBRE
☐ DUPONT "TYNEX" NYLON *(Authorized Distributor)*

Contact us for fast, complete service on your bulk fibre and wire needs for Street Sweepers and Gutter Brooms. As direct importers and suppliers, with 3 warehouses serving the nation, we offer top quality fibres. Our prices are very competitive.

Contact your supply dealer or write for free samples and prices



STREET BROOMS

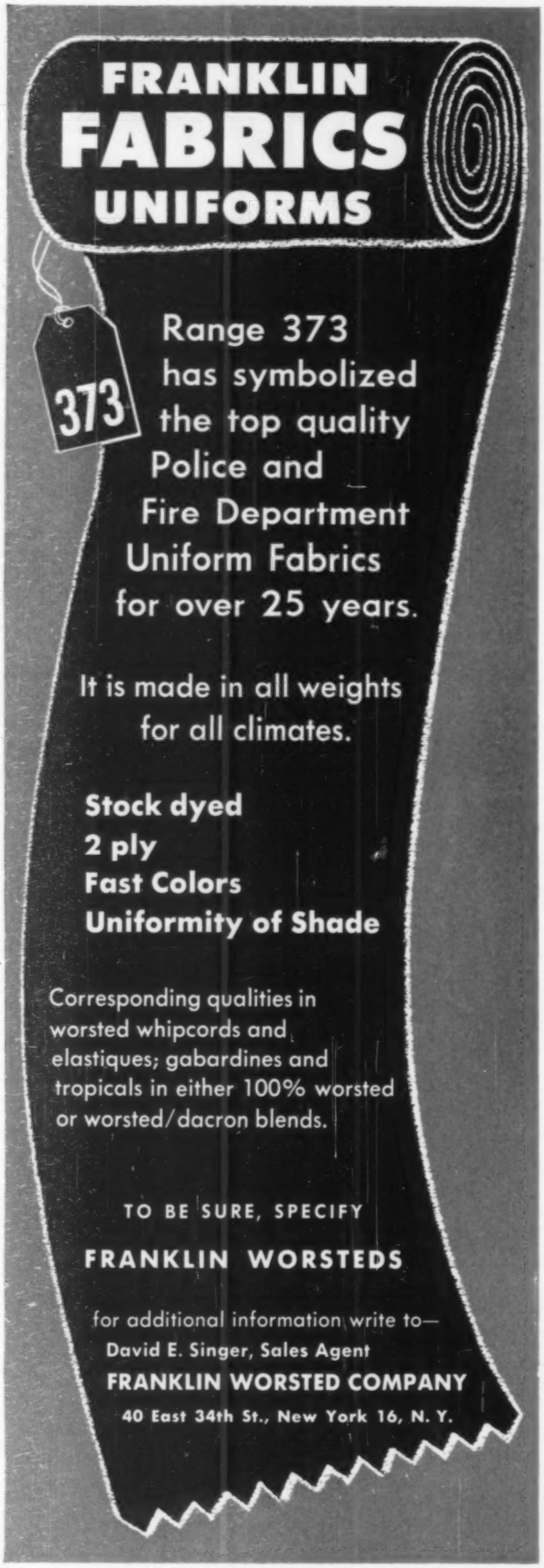
We supply the right street push broom for every job . . . at the right price . . . in all popular fibres including Calabar Bass, Bassine, Palmyra Stalks and Flonene Plastic.

Contact your supply dealer or write for complete information.

FLO-PAC FIBRES, Inc.

1501 4th Ave. So., Minneapolis 4, Minn.

Subsidiary of
FLOUR CITY BRUSH CO. MINNEAPOLIS 4, MINN.
PACIFIC COAST BRUSH CO. LOS ANGELES 21, CALIF.



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Range 373 has symbolized the top quality Police and Fire Department Uniform Fabrics for over 25 years.

It is made in all weights for all climates.

Stock dyed
2 ply
Fast Colors
Uniformity of Shade

Corresponding qualities in worsted whipcords and elastiques; gabardines and tropicals in either 100% worsted or worsted/dacron blends.

TO BE SURE, SPECIFY

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for additional information write to—
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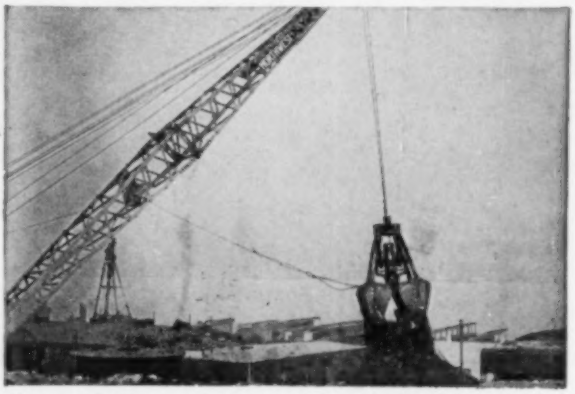
FRANKLIN WORSTED COMPANY
40 East 34th St., New York 16, N. Y.

No spot for a breakdown!

KEEP IT GOING AT ITS BEST...USE ONLY GENUINE HAYWARD REPAIR PARTS!

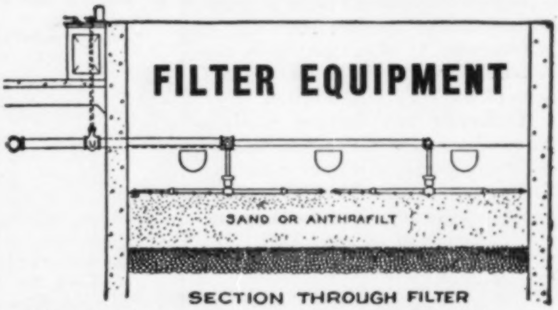


Hayward Buckets are designed with the most efficient construction features known. And only with *genuine* Hayward replacement parts can you be sure of maintaining that same high quality. Cheaper "bootleg" parts reduce efficiency, raise costs and disrupt schedules.

Anticipate any possible breakdown.
Write today for list of genuine Hayward parts.

THE HAYWARD COMPANY
50 CHURCH ST., DEP'T A, NEW YORK 7, N. Y.
Builders of Better Buckets Since 1888

PALMER



SECTION THROUGH FILTER

Filter Bed Agitator Advantages

- Requires an average of 40% less wash water
- Eliminates mud balls
- Prevents cracking and shrinking of the beds
- Produces "new" sand after short period of normal operation
- Enables you to increase filter runs up to 50%

Anthrafilt Advantages

- Doubles the length of filter run attainable with sand and quartz media
- Requires one-half as much waste water
- Filters are out of service less because of the shorter wash cycle
- Coating, caking or balling with mud, lime, iron or manganese reduced to the minimum

Write for Circular

PALMER FILTER EQUIPMENT CO.
P. O. BOX 1655, ERIE, PA.

(Continued from page 221)

erated as part of the Body and Hoist Division of The Heil Co.

The principal product in the newly acquired materials handling line is the Load Lugger, which consists of large detachable steel containers or bodies which are picked up, hauled and dumped by a truck equipped with a Load Lugger hoist mechanism. A single truck so equipped can serve a number of containers stationed over a wide area. The containers are used to handle scrap, trash, sludge, by-products, dust.

Easy to Relamp

Easy to relamp because of open bottom, this luminaire with Joslyn-Holophane refractor accommodates incandescent lamps up to and including 6000-lumen or 175-watt mercury lamps. It's ideal for residential street lighting as well as for suburban and rural yard lighting. Get details from **Joslyn Mfg. and Supply Co., 155 N. Wacker Drive, Chicago 6, Ill.**

Memories for Computers

In the past, RCA has supplied components for computer manufacturers to use in building memory systems. Now, RCA becomes the first company in the country to offer a full array of computer elements from transistors to complete memory systems.

A memory system, as distinguished from memory components such as storage bins for information, has circuitry that puts information into its units, or takes it out. The time required to do this ranges from 5 millionths to 20 millionths of a second.

Kenneth M. McLaughlin, Manager, Computer Products and Materials Dept., RCA, Semiconductor and Materials Division, Somerville, N. J., said that the volume of business anticipated for the first half of 1961 has warranted the addition of 20,000 square feet of floor space to the division's manufacturing plant at Needham, Mass.

Of special importance, he said, is the fact that RCA memory systems can be custom-designed to meet the customer's requirements for voltage, current, temperature range, speed of operation and any other factors to make the systems fully compatible with his present equipment.

Water Supply Conservation

Layne Associates, a new organization, headquartered in Memphis, Tenn., has been formed to promote progress in the development and

(Continued on page 225)

OMAHA *chose* STEEL PIPE *for* FEEDER MAIN

. . . every length was hydrostatically tested in the shop to AWWA standards!

Maximum length and minimum wall thickness, as only steel pipe provides, enabled the Metropolitan Utilities District of Omaha to install a big pipe line through a quiet residential district with little inconvenience. Only 180 ft. of narrow trench was open at one time to install the coal tar enamel coated 48 in. diameter, 3/8 in. wall thickness steel pipe in. 40 ft. lengths.

Workers of the Metropolitan Utilities District, under the direction of General Superintendent Kenneth Young, are shown lowering a section of pipe into place in the trench just a few feet behind the digger.

STRENGTH
TIGHTNESS
ELASTICITY
ECONOMY
LONG LIFE

...these are inherent qualities of fabricated *steel* pipe. Compare *steel* pipe with other types . . . you'll see why "wherever water flows, steel pipes it best." You can always specify *steel* pipe with confidence.

For your copy of the latest steel pipe brochure, write—

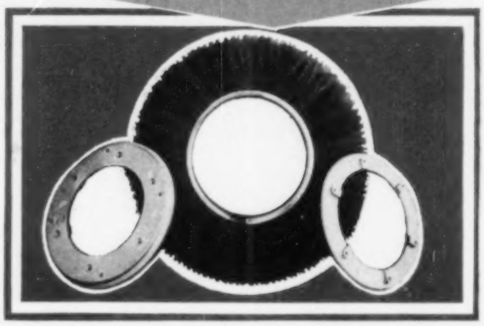
STEEL PLATE FABRICATORS ASSOCIATION
105 West Madison Street • Chicago 2, Illinois

DO IN 10 MINUTES
WHAT USED TO
TAKE HOURS

USE...

DANLINE PREMADE GUTTER BROOMS!

59-33



Only with Danline Premade Gutter Brooms can you strip and refill worn brush sections in minutes — ***instead of hours!*** Unique construction of Danline housing holds complete gutter broom in one premade section. Remove only 6 bolts, insert new section, fasten bolts — you're ready to resume sweeping. Factory fabrication insures proper balance of brush, eliminates shimmy. Easy! Simple! Economical! Write now for facts and illustrated literature.

Leadership Proved Through Performance!

NEWARK

NEWARK BRUSH COMPANY
260 MICHIGAN AVENUE
KENILWORTH, NEW JERSEY

LOWEST COST
PIPE
INSTALLATION

BY USING **HYDRAUGER***

*EARTH BORING TOOL

Reg. U. S. Pat. Office

OPEN HOLE

- UNDER STREETS
- UNDER FREEWAYS
- UNDER GARDENS
- UNDER PAVEMENT

HYDRAUGER—

- ELIMINATES TRENCHING
- REDUCES COSTS UP TO 90%
- BORE—UP TO 250 FT. 2 INCH TO 24 INCH
- NO FUMES OR SHOCKS

Write for booklet—

HYDRAUGER CORP., Ltd., 681 Market St., San Fran. 5, Calif.

Please send without obligation, to me, the HYDRAUGER BOOKLET which shows relative costs and speeds of BORING as well as specifications of various Hydrauger models.

NAME__________

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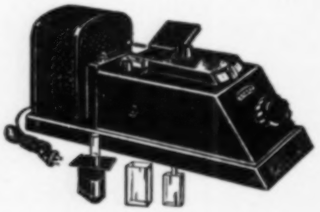
KLETT SUMMERSON
ELECTRIC PHOTOMETER

Adaptable for Use in Water Analysis



Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined.

KLETT MANUFACTURING CO.
179 East 87th Street, New York, N. Y.

(Continued from page 223)

conservation of water supplies and to provide technical information through research in the field of water.

It is composed of members from each of the thirteen Layne Associate well drilling firms, and Layne & Bowler Inc. The research division of Layne Associates is regarded as the largest research laboratory in the world devoted exclusively to water problems and the development of water supplies.

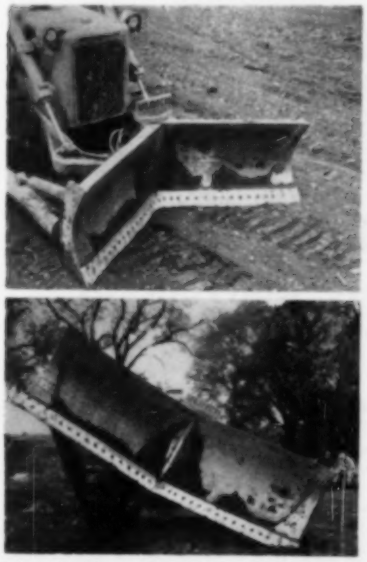
Announcement of the formation of Layne Associates was made by John M. Proos, executive secretary of the organization and chairman of the Board of Directors of Layne & Bowler, Inc., Memphis, Tenn., manufacturers of Layne vertical turbine pumps.

Tool for Earthmovers

A utility bulldozer blade with an almost unlimited range of hydraulically-controlled blade positions has been introduced by Ulrich Mfg. Co. It's called the Varidozer and can be changed from straight blade to an angle blade, forward "V", reverse "V", tilt blade, or to any combination of these positions. The entire cycle of positions is controlled by four hydraulic levers mounted beside the tractor seat, giving fingertip control of the blade, under full load or empty, while the machine is moving in either direction.

Each of the two sections of the blade move independently to any position from full 25° angle forward to a full 25° rear. The entire blade can be tipped 10° forward or back and tilted up to 56 inches to either side.

The Ulrich Model 6H Varidozer is designed for use on Caterpillar D6 tractors. It is the first of a series. For more information, write ULRICH MANUFACTURING CO., ROANOKE, ILL.



The Varidozer blade in forward "V" position, particularly useful when earth is to be transported from one part of the job to another. Below, it is shown tilted a full 56 inches.

Premade Gutter Broom Refills

A premade gutter broom section developed by NEWARK BRUSH CO., 260 MICHIGAN AVE., KENILWORTH, N. J., eliminates tedious hours of hand labor in refilling worn gutter brooms.

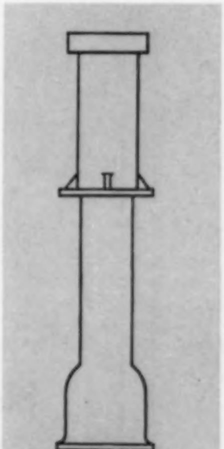
The section is bolted between an aluminum housing and a retaining ring with six bolts. Worn gutter

(Continued on page 227)

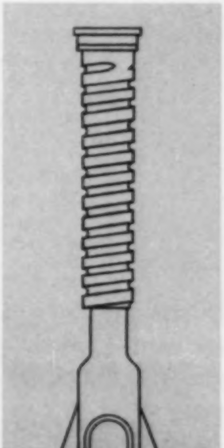
BUFFALO MUNICIPAL CASTINGS

are available in every size and style!

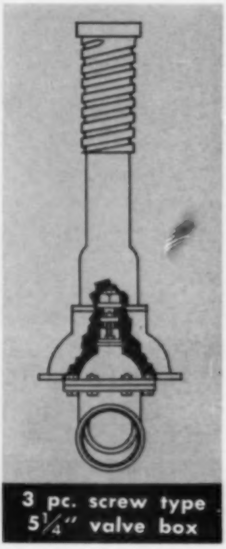
No matter what size, shape or style municipal casting you may desire—you're practically sure to find a "Buffalo" casting to serve your needs. Or, where desired, castings may be made to your own specifications. Whether you need valve, service or roadway boxes, meter boxes, manhole rings and covers or other municipal castings, you'll find all "Buffalo" castings designed for service and dependability.



2 pc. sliding type adj. 5¼" valve box



2½" water or gas ext. service box



3 pc. screw type 5¼" valve box

Prompt quotations given on all your standard or special gray iron or non-ferrous castings.

Write or wire Dept. J for Bulletin M11.

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FILTER SAND AND GRAVEL

Produced from an inland pit hence free from river contamination and foreign matter.

Shipment in bulk or bagged.

Many of the larger filter plants throughout the United States are equipped with our products.

PROMPT SHIPMENT

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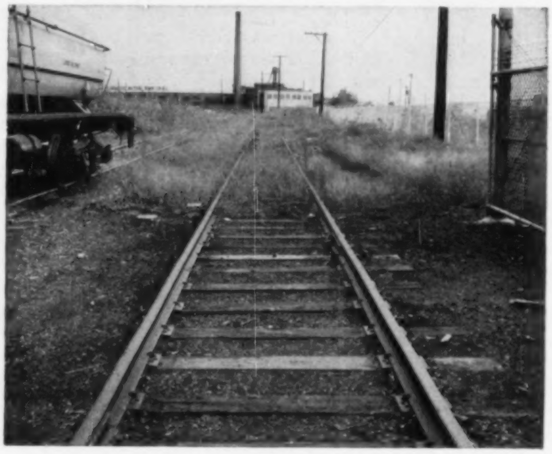
Muscatine, Iowa
P.O. Box 307 Amherst 3-2711

THIS PICTURE SHOWS WHAT WEED OUT TREATED AREA LOOKS LIKE AFTER 2 YEARS

Note the abrupt Weed line at the gate



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ON WEED OUT

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4911 South Racine Avenue-Chicago 9, Illinois

THE J. M. CLEMINSHAW CO.

— APPRAISERS —

Founded 1923

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Union, New Jersey, 2165 Morris Avenue
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The Jefferson with its new facilities for handling all convention groups is fast becoming Atlantic City's most popular convention hotel.

The Jefferson features an abundance of Meeting, Banquet and Exhibition Rooms fully equipped to handle your every need. Experienced personnel. Location ideal in heart of Atlantic City.

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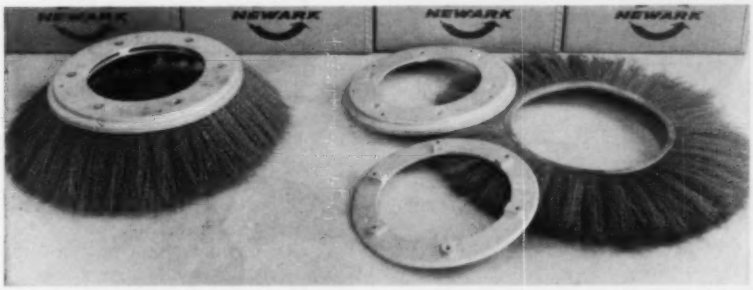
FOR DESCRIPTIVE LITERATURE

Convention Manager
Hotel Jefferson
Atlantic City, N. J.

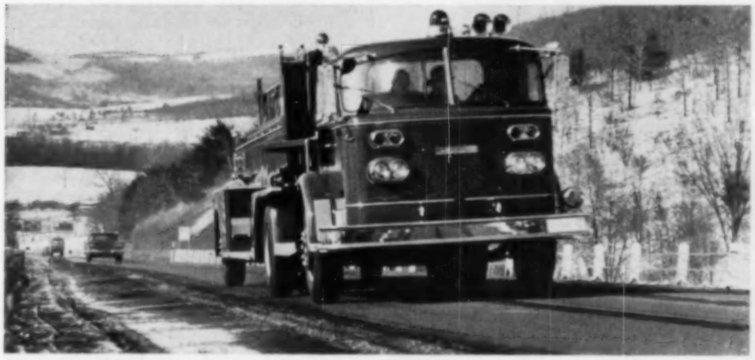


(Continued from page 225)

broom sections are removed easily and a new section bolted in place in about 10 to 15 minutes. Housing design imparts the traditional gutter broom shape to the premade brush section and also provides pockets in the brushing surface which are, the manufacturer maintains, useful in removing large objects from gutters.

The premade gutter broom sections filled with tough .041 round crimped rust-resistant brush wire provide 20% longer life than present gutter brooms. Gutter broom refills are shipped ready for use. The sections are standardized and will fit almost all self-propelled sweepers.

Fastest Climbing Fire Truck



Newest aerial ladder fire truck in Seattle, Wash. is powered by a Boeing 330-hp turbine engine weighing 325 pounds, one-tenth the weight of conventional power plants. Prior to delivery, the Turbo Chief underwent rigorous testing over snow and ice-covered hills surrounding Elmira, N. Y.—terrain similar to Seattle's. It is shown here demonstrating its power by climbing this mile-long hill with an 8% grade from a standing start in 56 seconds, reaching a speed of 50 mph. The 16-ton, 53-foot long truck, equipped with 100-foot aerial ladder, was built to Seattle's design requirements by American LaFrance, a division of Sterling Precision Corp.

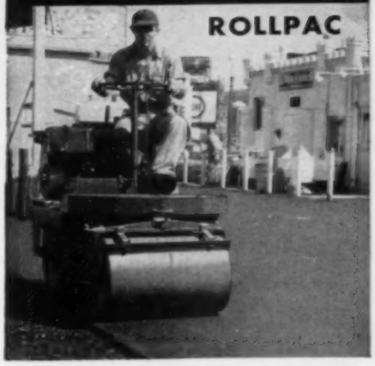
5-Ton Crane Excavator

Three years of design, engineering and testing have gone into this compact Model 250 Bantam, a 5-ton rig featuring both cable and hydraulic operation. Digging and lifting operations are cable-operated; an efficient hydraulic system controls the swing. Arc of swing is 370° either right or left; swing speed is 5.5 rpm.

As a backhoe, the 250 Bantam will dig to a maximum depth of 12 feet 11 inches, and will produce an average of 100 feet of 5-foot trench per hour. Available as an option on the standard backhoe attachment is a hydraulically-actuated bucket, which

(Continued on page 228)

YOU CAN'T OUTGROW
A ROLCOR ROLLER
STATIC OR VIBRATORY



Whether your job is . . .

Crease rolling . . . Driveways . . . Parking lots . . . Patching . . . Tennis courts . . . Sod rolling . . . Maintenance . . . you won't outgrow the usefulness of a Rollpac.

That's why thousands of contractors, landscapers, institutions and others make Rollpac their "number one" unit. One week on *your* job will prove to you why Rollpac is the top selling one-ton roller in the United States.

Here's a two-ton vibratory roller that produces compaction to equal or exceed static rollers weighing eight tons! Vibrapac is 100% American designed and built specifically for asphalt and soil compaction—no corrugation of surfaces. A single lever clutch shifts from static to vibratory action. Works in close places.

Easy to transport with Rolcor Trailer.

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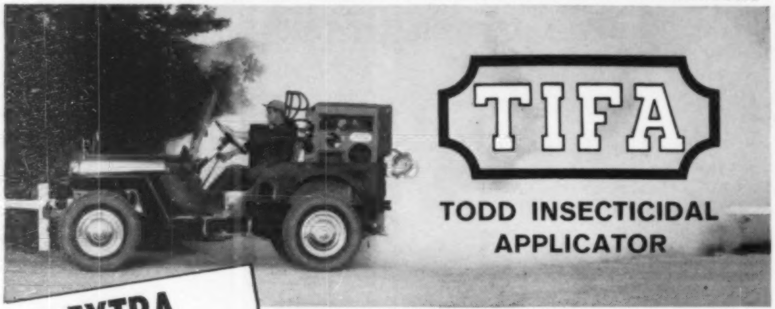
THE ORIGINAL AND WORLD LEADER IN INSECTICIDAL FOG GENERATORS

TIFA

TODD INSECTICIDAL APPLICATOR



EXTRA VERSATILITY EXTRA ECONOMY ON GASOLINE OR LIQUID PETROLEUM GAS

FOG OR MIST
DEADLIEST TO PESTS

True clean all-enveloping TIFA fog gets the kill wherever insects swarm. TIFA can also produce a useful fog mist or spray. Best by test for over 17 years, TIFA gives complete space control at lowest operating and maintenance cost in 7000 communities throughout the world. Peak performance with both new and older type insecticides . . . one-man operation. New Starter-Generator (optional) for immediate starts, easily attached to new and existing TIFA units. Listed by Underwriters' Laboratories, Chicago.

Write for illustrated folder and official comments.

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Sales and Service Agencies throughout the Western Hemisphere

AMERICA'S #1 TRENCHER

ARPS Trench-Hog
SINCE 1920

- PRICED WELL BELOW independent drive machines . . . below competitive units when quality features are compared.
- TRENCHES up to 800' per hour - 6" to 20" wide - 3½' to 7' deep.
- PRECISION - obtained by power pump boom control valve.
- CHOICE OF CUTTERS - slicer, chisel or Super-Service cutters for prevailing soil conditions.
- INDEPENDENT wheel control of accurate straight line or curved trenching.

*WANT PROOF OF TRENCH-HOG SUPERIORITY?

*WRITE NOW for this complete brochure on the features and merits of the Trench-Hog. Please state your model tractor!

ARPS CORPORATION
DEPT. AC-NEW HOLSTEIN, WISCONSIN

ARPS SINCE 1920

TRENCHERS • HALF-TRACKS • DOZERS • UTILITY BLADES

Purchasing

(Continued from page 227)

rotates 135° from fully retracted to fully rotated.

With crane attachment, the 250 will handle loads up to 5 tons and boom lengths to 45 feet. Standard crane boom is 25 feet, with 5 and 10-foot boom extensions available. An 8-foot jib with maximum 1500-pound capacity is also available for use with the crane attachment.

As a dragline, the compact unit will produce up to 85 yards per hour in average material, and will handle from 50 to 60 yards per hour when equipped with the clamshell attachment. As a shovel it will load up to 90 yards per hour out of stockpile.

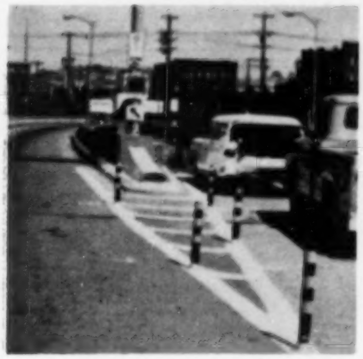
A specially engineered crane, Model 54, carrier built by Schield Bantam is job-matched and available for mounting the "250" upper unit. For additional information, write SCHIELD BANTAM CO., WAVERLY, IA. Request *Bulletin* 250-1.

Transistorized Utility Light

The new Esco Flare Utility Light operates on 18 volts, has no moving parts or relays. It is adaptable to the requirements of municipalities or any standard or special application where an exceptionally bright light is needed, reports ELECTRONIC SPECIALTIES CO., BATAVIA, ILL.

Among Esco Flare features are triple battery life at one-third usual battery operating cost; wide-beam optical lens, parabolic reflector with Alzac finish, power pulsator with selector transistors, collapsible stand that extends to 8 feet. On-off switch operates light and easy-to-read battery meter.

Traffic Delineator



Flex-O-Guide's new Model 400 Series replaceable surface type traffic delineator features a roll effect flange which cushions and minimizes wheel contact shock. Removal or replacement of the traffic marker can be accomplished without disturbing flange and surface bond. The flange design allows the use of a standard tool in locking clamp securing or in removing Flex-O-Guides.

For additional information on the Model 400, write Flexible Safety Zoning Co., Inc., 2341 South Laramie Ave., Chicago 50, Ill.

Announces Balanced Power Engine Generators

Powered by a Wisconsin VH4D air-cooled gasoline engine, these new Winco engine generators are rated at 12,000 watts a.c., and are equipped for remote starting. Tests show they will carry such loads as a 5-hp motor, plus 6000 watts of simultaneous resistive load.

They are capable of producing ample power and energy for a variety of standby and portable power needs and for mobile power.

This new Winco series features Maxi-Watt Power control, which gives maximum power for unusually heavy motor loads, maximum efficiency for normal loads.

According to Lyman Phillips, sales manager, "these new Balanced power Winco engine generators permit the engine to operate at optimum speed for high performance and long life; the 115/230 volt 60-cycle generator at maximum power speed."

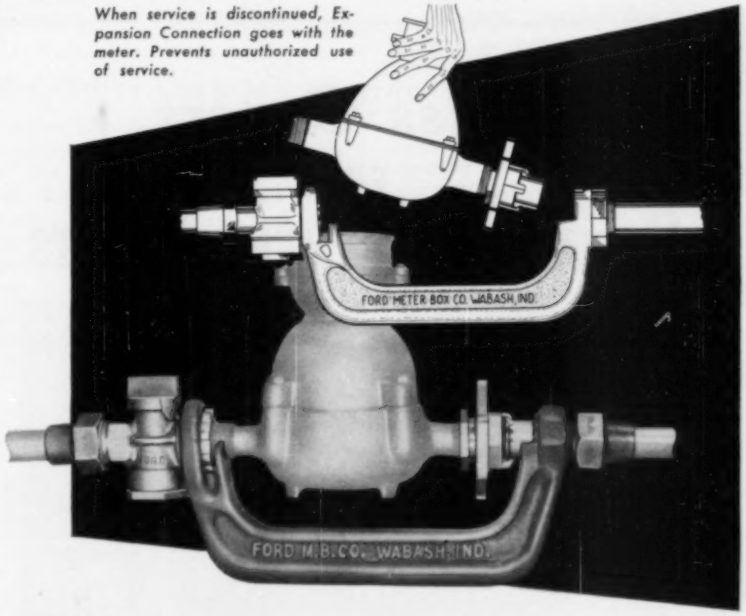
For additional information, write Wincharger Corp., East 7th & Division Sts., Sioux City 2, Ia.

Tandem Power Roller

This self-propelled unit delivers 1000 pounds of rolling power, evenly distributed between its two 18-inch x 24-inch diameter rollers. Its power source is a 4-cycle, 2¼-hp Clinton gasoline engine with forward and reverse drive.

Rollking TD-1000 operates at speeds of 2.0 to 3.5 mph. Engine and operator's seat are mounted on the

(Continued on page 230)



When service is discontinued, Expansion Connection goes with the meter. Prevents unauthorized use of service.

THE FORD TWIST

that makes In-Line meters easy to change

Whenever meters are set in-line with service piping, especially in outside settings, they are notoriously difficult to get in or out. The Ford *twist* is a simple handwheel operated Expansion Connection on every Ford Straight Line Yoke. To begin with, the Ford Yoke holds both inlet and outlet piping rigidly in perfect alignment and with ample space to slip the meter in or out of position. Then, the Ford handwheel operated Expansion Connection fills the gap and automatically pressure seals both meter ends against rubber gaskets.

Millions of Ford Yokes already make meter servicing a pleasure. Are they doing it for your meter department?

Write for complete information on models available for every condition.

FORD

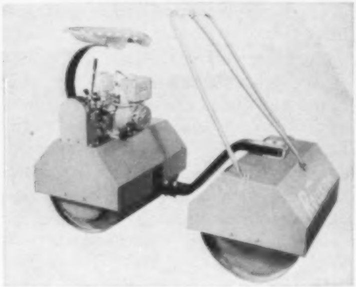
for *better* water services

THE FORD METER BOX COMPANY, INC., Wabash, Indiana

(Continued from page 229)

rear roller which is connected to the front roller by means of a steel tie-bar hook up.

Rowco Mfg. Co., Inc., Keene, N. H., designed this all-chain driven unit for heavy-duty use on expansive lawns and seeded areas on golf courses, tennis courts, baseball and football fields, parks, highways, recreation and parking areas. Rollking TD-1000 also is well adapted to hot-top repair work.



Swimming After Dark Will Be Safer

Designed to operate on 12-volts from a remotely located isolating transformer, this new underwater swimming pool lamp sharply reduces the shock hazard potentially existing with the operation of 120-volt circuits in pools.

Seven inches in diameter, it has a built-in reflector. It throws a wide flood of light under the water—90° horizontally and 40° vertically—and has a peak beam candlepower of 13,500.

Although it is made of hard glass, the lamp is recommended for use behind a cover plate in a water-tight housing. Bulb breakage is possible if the lamp is touched by water after becoming hot during operation.

Rated at 300 watts, the lamp carries a retail price of $5.75. Limited quantities are now available.

For additional information, write General Electric Co., Nela Park, Cleveland 12, Ohio.

Self-Unloading Refuse Transporter

Municipalities seeking to overcome the problem of "long distance" hauling of refuse by use of transfer stations will be interested in the new Refuse Transporter, a conveyor unloading unit which hauls the contents of from six to ten refuse collection vehicles in one load to the disposal site. It has been introduced by Prairie State Equipment Co., Thornton, Ill., and is designed to help reduce the cost of refuse handling.

Glass Covers

FOR

SEWAGE TREATMENT PLANTS

LIFETIME ALUMINUM CONSTRUCTION

Now available in lifetime aluminum construction with supporting steel framework. For sludge beds, sprinkling filters, tanks or wherever a glass cover is needed.

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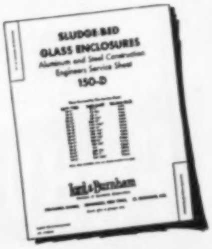
Write today for your new set of Engineers' Service Sheets AC-361 containing details, specifications and recommendations for every job request.



Lord & Burnham

DIVISION OF BURNHAM CORPORATION

IRVINGTON, N. Y. DES PLAINES, ILL.

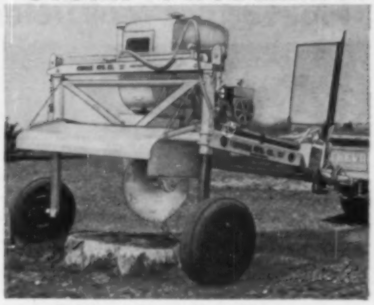
Custom-Fitted Police Patrol Cars

Conversion of panel trucks into ambulances, police patrol cars and first aid emergency vehicles has been gaining wider acceptance among municipalities. One such conversion is this Police Patrol by Shop of Siebert Associates, which is now utilizing Chevrolet 1961 model 1- and 1½-ton panel trucks and Greenbrier Sports Wagons for police car and ambulance units.

Police Patrols come equipped with partition with sliding glass protected by steel screen. Rear compartment has box bench and folded padded seat. Rear door windows are protected with steel screens. Other features include roof ventilators, interior lights and electric fan in the rear compartment, step plate on rear bumper and grab handles at rear door opening.

Complete specifications on both

(Continued on page 232)



HERE'S HOW 800 CITIES SOLVED THEIR STUMP PROBLEM...

Original Low Cost Vermeer

POW-R-STUMP CUTTER

Rips Stumps To Shreds In Minutes!

You'll save hundreds of back-breaking man-hours and thousands of dollars annually . . . with a Vermeer Pow-R-Stump Cutter. The choice of tree experts everywhere! It's the modern way, the economical way to remove ugly stumps. A one-man operated unit. Removes stumps 10" below the ground. Write for complete information, low price and FREE demonstration.

VERMEER MANUFACTURING CO.
1452 W. WASHINGTON, PELLA, IOWA

TWO PIECE

5¼" two-piece sliding or screw type cast iron valve boxes, covering 4" through 10" valves.

ADJUSTABLE VALVE BOXES

THREE PIECE

5¼" three-piece valve boxes supplied with bases for 4" through 24" valves. Interchangeable parts.

Manufactured to the highest standards for sure service.

A complete line of service and roadway boxes, manhole rings and covers. (Covers marked gas or water)

OPELIKA FOUNDRY CO.
OPELIKA, ALABAMA
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How to Keep Track of Every Key

TELKEE KEY CONTROL

$73.90 Complete
(75 capacity)

TELKEE simplicity tags and numbers keys, in order. Visible index identifies keys by lock location, number, description.

TELKEE convenience shows all keys at a glance. Locates loaned or assigned keys instantly. Saves time, saves money.

TELKEE security provides complete continuous record of all keys issued. Key identities known only to authorized personnel.

Available in 10 models, 33 capacities from 21 to 2240. Compact cabinet of fine furniture steel, tens of thousands in use in offices, industrial plants, hotels, stores, schools, hospitals, and public buildings, large and small, in U.S.A., Canada, and overseas.

FREE *16 page booklet. No obligation. Write for your copy today.*

P. O. MOORE, INC. GLEN RIDDLE 18, PA.

GOLDAK TRANSISTORIZED LOCATORS

Pipe Locator-Leak Detector

"Dualtronic"

Model LC-5T

The new "Dualtronic" combines the finest transistorized Pipe Locator ever developed with a high-gain Leak Detector to produce an effective and useful multi-purpose instrument. Designed specifically for Municipalities and Water Companies, the LC-5T assures pin-point detection of pipes, cables, mains and laterals and becomes a sensitive detector for water leaks simply by plugging in a crystal, rubber-encased microphone. Additionally, by a simple manipulation the new "Dualtronic" will pin-point valves, risers, boxes, and manhole covers. Now with transistors the versatile LC-5T is lighter, more sensitive, easier to operate, and it requires only flashlight batteries . . . Write today for further details on the "Dualtronic" and other Utility detection instruments.

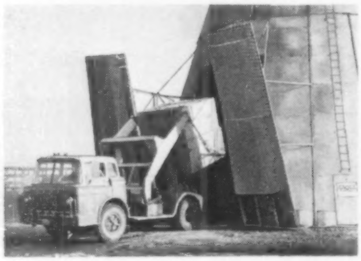
For PIPES

For LEAKS

The GOLDAK Company, Inc.
Leading Electronic Manufacturers
Since 1933
1544 W. Glenoaks Blvd.
Glendale 1, Calif.

WORLD'S FINEST DETECTION EQUIPMENT MANUFACTURERS SINCE 1933

Extend Landfill
Life Up to 85 Per Cent



Wilco Tepee Refuse Burner®

is the efficient, economical and safe method for complete disposal of all bulky municipal wastes not suited for landfill. Send coupon for detailed information.

wilco machine works, inc.
Box 3897AC-4 Memphis, Tenn.
Phone WH 8-4555
Send details on Wilco Refuse Burner to:
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Company__________
Address__________
City__________ State__________

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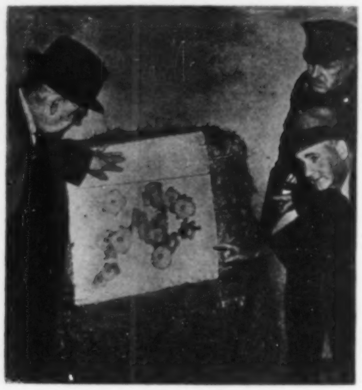
Municipal Supplies Catalog
SPECIFY YOUR TITLE ON YOUR REQUEST
W. S. DARLEY & CO.
CHICAGO 12

Purchasing

(Continued from page 231)

police car units and ambulances can be obtained directly from Shop of Siebert Associates, Inc., Waterville, Ohio.

A Shotgun-Proof Light



An electric sign that remains lighted after being punctured by shotgun pellets or rifle bullets was displayed in New York City recently by Sylvania Electric Products Inc., subsidiary of General Telephone & Electronics Corp., 730 Third Ave., New York 17, N. Y. Panelescent lamps, thin phosphor-coated metal sheets, make this possible. The lamps form the characters and background of the sign. They will operate for more than five years without maintenance problems and with a low power consumption. Sylvania expects to develop an immediate market for these highway advertising and directional signs.

The "Panelescent" lamp produces light by sending an electrical current through a layer of phosphors on a thin porcelain enamel and steel base, a plastic base, or a glass base. It has no filaments, no gases to contaminate, no emissive material, the life of these lamps is five to seven years.

Giant-Size Shredder

The new Royer shredder is a compact, portable, complete soil processing plant equipped with a 70-hp engine and a 90-foot wide hopper. It has a shredding capacity of up to 1200 yards per hour.

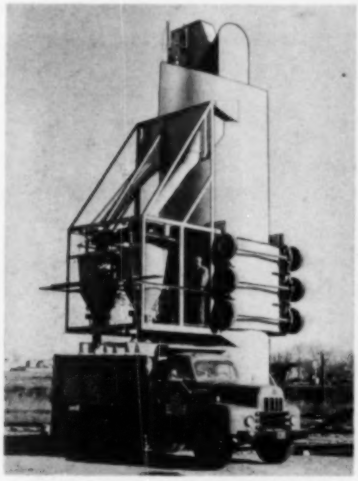
The Paul Bunyan 360, as it is called, shreds, blends, mixes and aerates materials — rejects stones, trash and other undesirables—in one operation. It has an adjustable sweep and deflector that permits various textures of finished material and dis-

After taking charge from the loader, Paul Bunyan 360 discharges shredded materials into truck. Refuse has been rejected from the belt and piled away from the loading area.

charges it where it is needed—into trucks, on massive stock piles, etc. The machine is capable of taking 2 cubic yards from a bucket loader or drag line.

For additional information, write DEPT. P.B., ROYER FOUNDRY & MACHINE CO., 158 PRINGLE ST., KINGSTON, PA., ATT.: W. P. DICKINSON, SALES MANAGER.

High Production Paving Plant



This portable paving plant delivers 360 batches per hour (within specification tolerance). Speed, accuracy and high production is accomplished by combining a 400 barrel Nomad portable cement silo with twin paving batchers and a 600 barrel per hour elevator. An automatic system provides two-stage cutoff.

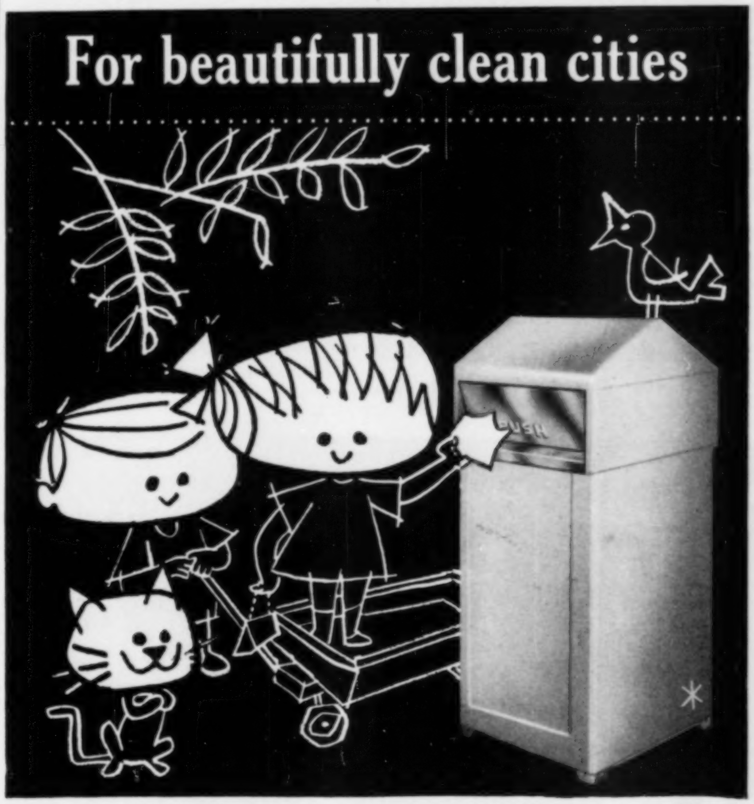
The plant is one of the Nomad plants, designed in different sizes up to 450 barrel capacities and easily transported to the job site. For complete details, write ENGINEERED EQUIPMENT, INC., WATERLOO, IA.

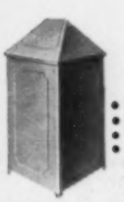
Adds to GraderscrapeR Line

A new, larger, more versatile GraderscrapeR with a 4-cubic yard capacity has been announced by Martin Company, Kewanee, Ill. Designed for use on Caterpillar motor graders, the GS-40 carries a full ½-yard more material than the previous model. It mounts in place of the circle and blade. Regular grader controls are used and the unit uses the immense traction of the grader tandem to load without pushing, even on uphill grades.

Clearance in carry position is 12½ inches. Positive ejection is hydraulic, bulldozer type. The GS-40 can be dumped in any gear, forward or reverse. The grader unit can be tilted to either side of the machine to cut ditch sides while the grader runs level. It can be shifted to cut on an

(Continued on page 234)





Superior Waste Receptacles

Handsome Superior receptacles invite citizen cooperation in your clean-up campaigns, encourage neat waste disposal indoors and outdoors. Sturdy construction and long service life keep maintenance costs to a minimum.

***WEATHERMASTER**

- Rainproof flaps swing in, operate independently. (No springs)
- 4 models to fit every requirement—available with advertising panels.
- Handsome styling—choice of colors.

JET
with stainless steel dome top—opens in any direction. Ideal for corner or against wall locations.

STANDARD Models

- Rounded corners.
- Steel legs.
- 7 sizes.
- Green, white or grey immediately available. Other colors on order.

JOHN WOOD COMPANY
Superior Metalware Division • St. Paul, Minn.
WIRE CRATES for paper and glass bottles • DISPENSER CANS • MILK CANS
ICE CREAM CANS • HARDENING BASKETS • HOODED and OPEN PAILS
STRAINERS Metalware for the Dairy Industry and Waste Receptacles

MEN WORKING

This compact Jaeger Model 2PN, pumps all the water a 2" suction hose can handle. **With 2½" suction hose it pumps more than 14,000 gph.**

Now handle more water with Jaeger pumps

Today's Jaeger Sure Prime pumps deliver performance never before offered—and at slower, long-life operating speeds. For example, a Jaeger 6PH can handle 100,000 gph as a dewatering pump or deliver 975 gpm at 60 psi pressure for well point jetting or gravel washing. Base your pump buying on latest information. See your Jaeger distributor or send for catalog.

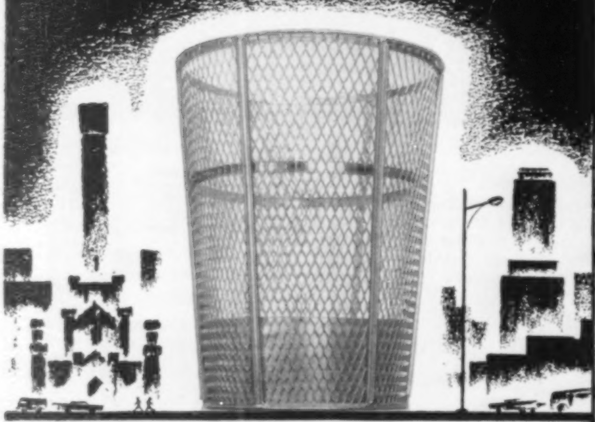
THE JAEGER MACHINE CO., 505 Dublin Avenue, Columbus 16, Ohio

AIR COMPRESSORS • MIXERS • PAVING SPREADERS and FINISHERS

DEMCOR EXPANDED METAL

LITTER BASKETS

Help keep your city CLEAN



Bus Stops
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Along the Highway
Public Parks

★ Durable ★ Rigid ★ Weather Proof
★ Low-cost ★ Galvanized ★ Built to last

Write for complete description and prices

DESIGNERS METAL DIVISION
of Southern Electric, Inc.
8701 S. Greenwood Ave. • Chicago 19, Ill.

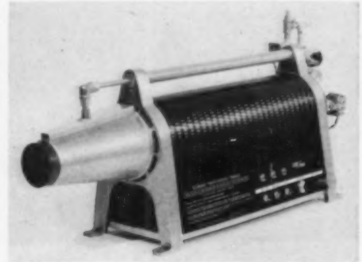
(Continued from page 233)

angle of 30° and shifted 9 inches outside the grader wheels. When tilted, it will cut a full 24 inches below ground-level to form one side of a "V" ditch. For details, write MARTIN COMPANY, 620 ANDREWS AVE., KEWANEE, ILL.

Compact Insecticide Fog Applicator

Designed for area control of mosquitoes and other insect pests, the See-Fog disperses a dense fog of steam-insecticide mixture from the 4-inch opening of its fogging cone.

Operation is simple. An electrically-driven water pump (the unit's only moving part), powered from the truck battery, supplies a metered quantity of water to a vaporizer coil.



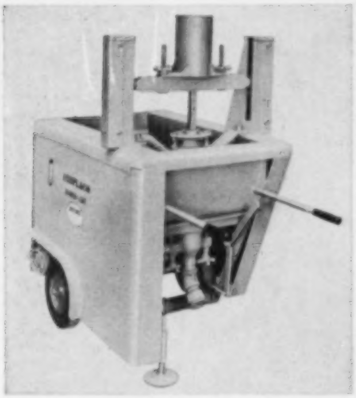
The coil, heated by an LP gas burner inside the fogger, produces a flow of steam that's ejected from a fogging nozzle. As the steam passes through the nozzle, it creates a vacuum that draws insecticide from the formulation tank. The mixture is then dispersed.

One person can operate See-Fog as he drives. For more information, write THE SEEBURG CORP., 1500 N. DAYTON ST., CHICAGO 22, ILL.

Mud Jacking Pump

The Hydra-Jack, a combination pump introduced by Airplaco for soil cement applications for slab raising and leveling, soil stabilization and underpinning, may also be used as a sand-cement grouter in back-filling sewers, tunnels and forms.

Power for the 600-pound Model



HJ-11 Hydra-Jak is derived from a 6-hp Wisconsin air-cooled engine. Field-tested performance is reported as being 85 cubic feet per hour and the unit will pump at pressures up to 150 psi.

Permanently lubricated roller chain drive with coil springs overload takes up slack of an overload or stoppage. For additional information, write AIR PLACEMENT EQUIPMENT CO., 1000 W. 25TH ST., KANSAS CITY 8, MO.

Tape-Recording Watch Clock

The Guardsman tape clock supplies an embossed record of a watchman's tour of duty made directly from type on the recording key. It is tamperproof and uses neither ribbons, carbons, nor inking devices.

Each hour of each day has its ruled space on the tape, which is easier to read than a circular chart. The tape is sychronized to the clock mechanism, so omissions are easy to spot. The chart does not have to be changed every 24 hours.

DETEX WATCH-CLOCK CORP., 76 VARICK ST., NEW YORK 13, N. Y., also makes dial-type watchclock systems. Literature on all models and a 30-page property protection manual for municipalities available on request.

Re-new your structures with GUNITE!

★ durability
★ economy
★ flexibility

- DAMS
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estimates, specifications and surveys made free of cost to you. write, wire or call MElrose 4-8120

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18" Bottom
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DAYTONA BEACH
FLORIDA

ABOUT PEOPLE

C. A. Clarke

Jack Gebert

The Miro-Flex Company, Inc. of Wichita, Kans., the nation's largest producer of embossed street name assemblies and traffic control signs and highway signs, has promoted C. A. Clarke from the position of sales manager to the newly-created post of director of sales. John D. (Jack) Gebert has been named to fill the sales manager position.

Charles Lamar

Gordon Graham

Charles E. Lamar has been promoted from manager of sales to vice president of marketing and Gordon C. Graham, formerly plant manager, has been named vice president of manufacturing for the **Southern Pipe Division of U. S. Industries, Inc.,** Azusa, Calif., according to D. A. Stromsoe, Division president.

Edward G. Cole, Jr., president of R. D. Cole Manufacturing Co., Newnan, Ga., was elected president of the **Steel Plate Fabricators Association, Inc.** during the Association's recent 28th Annual Meeting. Mr. Cole served as vice president of the SPFA during 1959 and 1960 and now succeeds Walter B. Van Wart, president of Wyatt Industries, Inc., Houston, Texas.

In announcing the appointment of E. C. Chapman to assistant manager of **Caterpillar Tractor Co.'s** sales development department, W. K. Cox, vice president, also announced that the northwest and southwest sales divisions will be merged into the new western division, managed by J. A. Justeson. W E. McCoy, manager of the southwest division, succeeds Chapman as manager of the eastern division.

E. C. Chapman

Reinaldo (Ray) Bibolini has been appointed manager of the newly-created Foreign Operations Department of **Byron Jackson Pumps, Inc.**, according to an announcement by John P. Adams, vice president and general manager of this Borg-Warner subsidiary.

Carl J. Hockenauer has joined **Auto Crane Company** of Tulsa, Okla. as southwestern sales manager, according to Carl White, Jr., president.

John M. Adams has been appointed regional manager of the Los Angeles region for the **Crouse-Hinds Company,** Syracuse, N. Y.

The appointment of three district sales managers for **Austin-Western**, Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Aurora, Ill., has been made known by A. Merrill Smith, field sales manager. Henry W. Ludwig's territory will include Minnesota and North and South Dakota; Harold J. Feekays will direct sales activities in Tennessee, Mississippi, Louisiana and Arkansas; B. Alton Wolfe will cover the territory that includes Ohio, Michigan and Indiana. All will supervise sales activities for A-W's complete line of equipment.

A. M. Klinger

L. F. Sexton

Three key sales and engineering men associated with Load Lugger and Huge Haul detachable container systems, lines recently purchased by **The Heil Co.** from Ingersoll-Kalamazoo Division of Borg-Warner Corp., have joined The Heil Co. A. M. Klinger will continue in his capacity as sales manager of material handling products; L. F. "Bud" Sexton has been appointed chief design engineer of these products, and George Palmer, former design engineer at Ingersoll-Kalamazoo, will continue in that capacity for The Heil Co.

Harland Bartholomew and Associates has assigned Thomas A. Campbell to its Memphis Office as part of the firm's expansion of its operations in the mid-south area.

Barrett Division of Allied Chemical, New York, N. Y., has named John F. Gordon assistant director of sales and Frank P. Collins sales manager for the New York district.

Henry Ludwig

Harold Feekays

Alton Wolfe

Warren Brown, president of the **Florence Pipe Foundry & Machine Company** and its sales subsidiary, R. D. Wood Company, recently announced the election of Addison O. Willis as vice president-manufacturing of Florence Pipe and the appointment of Frank H. Van Duzer as controller.

Maurice F. Perkins has resigned from his position as Principal City Planner with the Detroit City Plan Commission to devote his full energies to his firm, **Perkins, Rogers & Associates**, City Planning and Urban Renewal Consultants, located at 800 Livernois Ave., Ferndale, Mich.

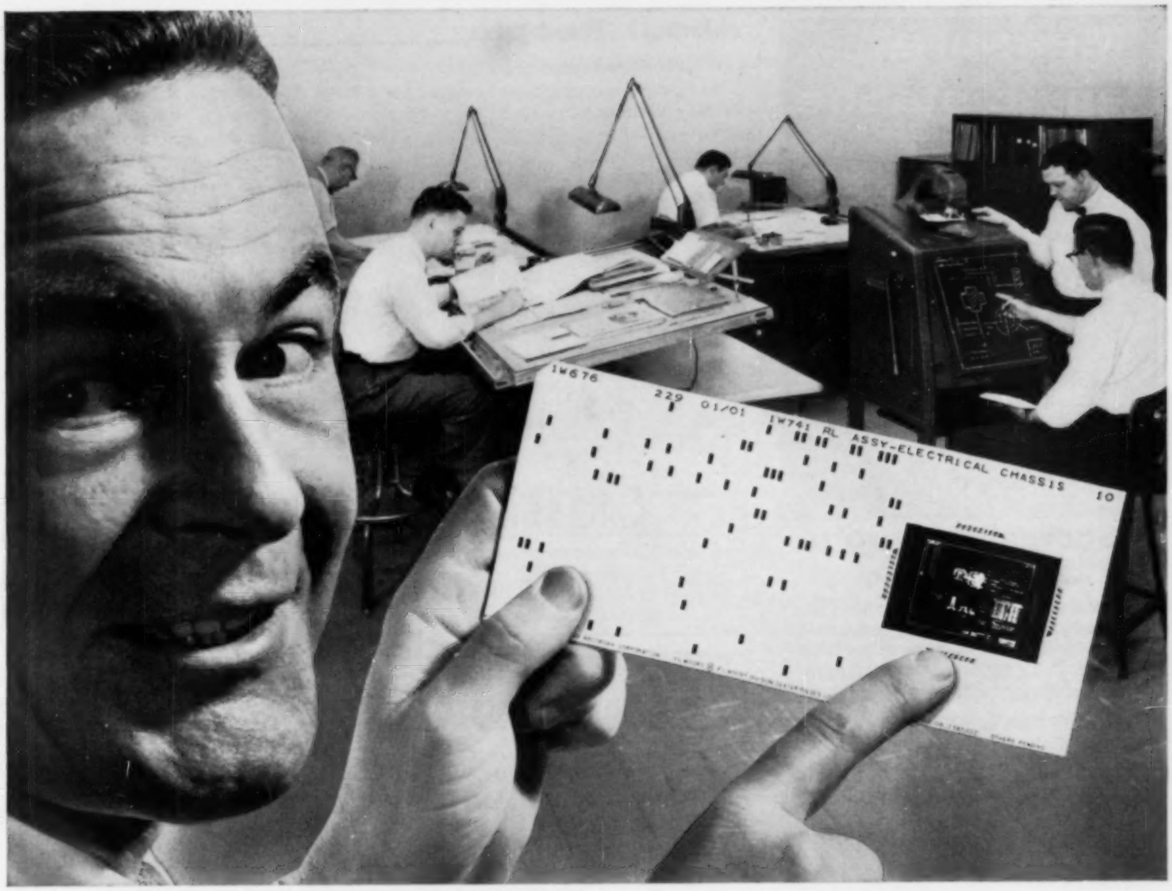
Louis F. Heckmann, vice president in charge of sales of **The Union Metal Manufacturing Company**, Canton, Ohio, died of a heart attack on January 14 in Canton. He had been affiliated with Union Metal since 1937.

Samuel Rockwood

Edward Gorton

Edward D. Gorton and Samuel S. Rockwood have been appointed eastern and western regional sales manager, respectively, for the Trojan tractor shovel line of **The Yale & Towne Mfg. Co.**, Batavia, N. Y., according to an announcement by George E. Gunther, sales manager of the Trojan Division.

(Continued on page 238)



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Your success with an automated drawing file depends mainly on the quality of your microfilm reproductions.

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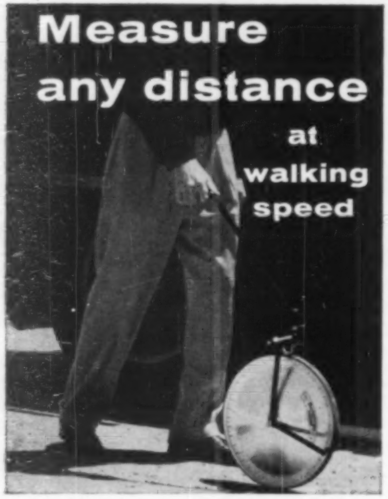

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About People

(Continued from page 236)

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Charles E. Masters, vice president in charge of finance for National Gypsum Co., has been elected to the Board of Directors of the **Lock Joint Pipe Company,** East Orange, N. J., producer of concrete pressure, sewer, culvert, and subaqueous pipe.

Herman R. Henken is now advertising and sales promotion manager for the **Electronic Data Processing Division, Radio Corporation of America**, and Robert Bruce is now manager, Government Marketing, Commercial Systems Department, RCA EDP Division.

S. A. Bunis has been promoted from assistant sales manager to sales manager of **Goulds Pumps, Inc.,** Seneca Falls, N. Y.

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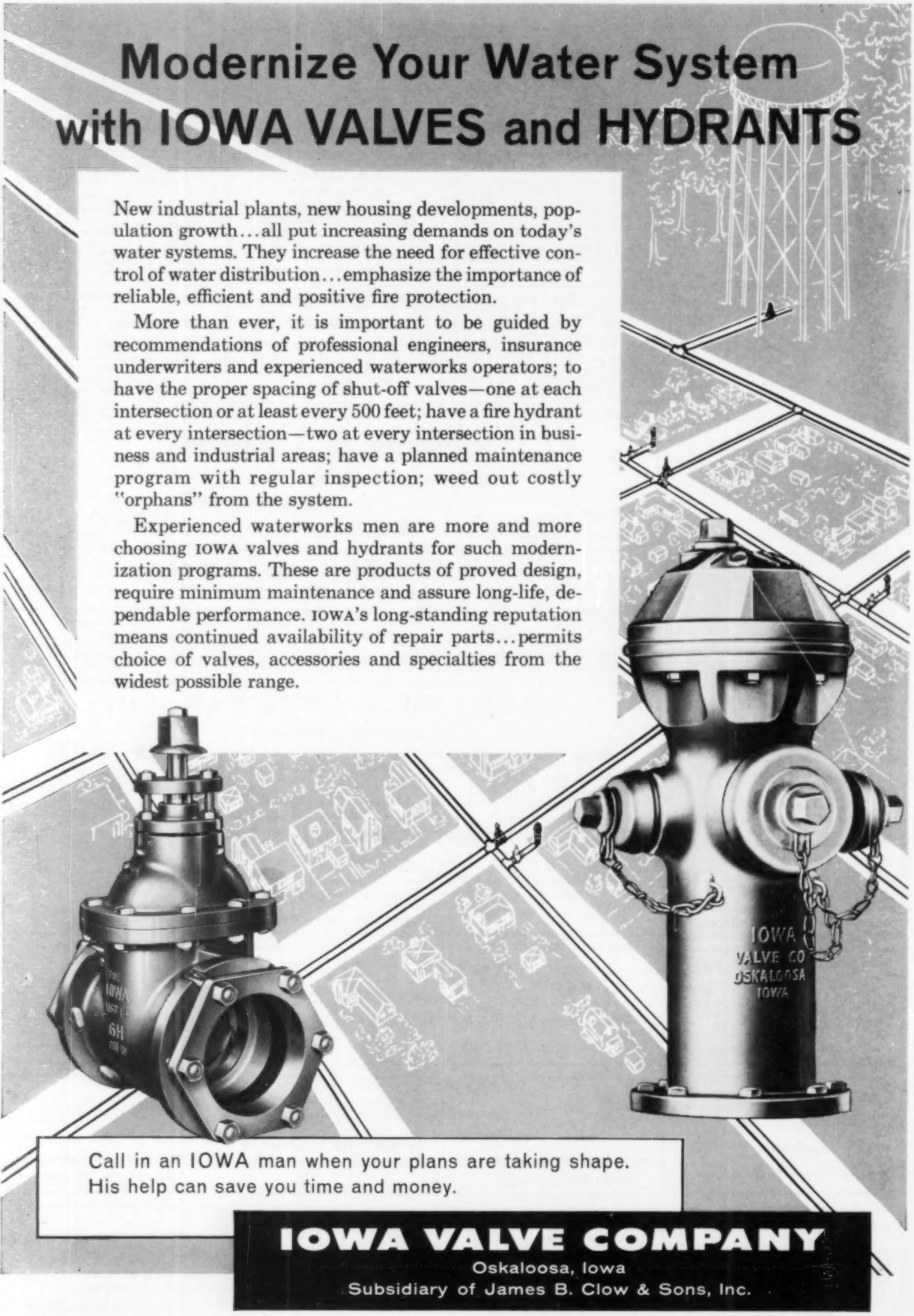

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Arps Corp 228
Asplundh Chipper Co 210
Atlas Copco 168
Austin-Western 82, 83
Automatic Signal Div., Eastern Ind., Inc 118
Automatic Voting Machine Corp 64

Badger Meter Co 46, 47
Baughman Mfg. Co 214
Bean Div., John 201
Bell Telephone System 4
Bennett Mfg. Co 185
Buffalo Meter Co 24
Buffalo Pipe & Foundry Corp 225

Case Co., J. I 188
Cast Iron Pipe Research Assoc 174, 175
Cataphote Corp 6
Caterpillar Tractor Co 48, 49, 252
Chevrolet Motor Div 164, 165
Chicago Bridge & Iron Co 38
Clark Equipment Co 254
Cleminshaw Co., The J. M 226
Clow & Sons, James B 70, 71
Cobey Corp 56
Cole Nursery Co 156
Colorado Fuel & Iron Corp 170
Columbia-Southern Chemicals Corp 167
Computer-Measurements Corp 153
Construction Machinery Co 180
Cook Well Strainer Co 18
Crouse-Hinds Co 120

Darley & Co., W. S 232
Darling Valve & Mfg. Co 171
Davey Tree Expert Co 186
Deere Industrial Div 20, 21
Dempster Brothers, Inc 184
Designers Metal Corp 234
Dietz Company, R. E 11
Dolge Company, C. B 220
Dorr-Oliver Inc 148
Drott Manufacturing 14, 15
Duncan Parking Meter Corp 124

Eagle Signal Co 45
El-Tec, Inc 221
Evinrude Motors 141

FencPainteR Div 226
Fitchburg Engineering Corp 199
Flexible, Inc 22, 23
Flex-O-Lite 63
Flo-Pac Fibres, Inc 221
Ford Meter Box Co., Inc 229
Ford Motor Co 16, 17
Ford Motor Co., Tractor & Implement Div 50
Franklin Worsted Co 222
Fulton Cotton Mills 147

Gar Wood Industries 152
Globe Electronics 207
Gojer, Inc 210
Goldak Company 232
Good Roads Machinery Corp 216
Gravely Tractors, Inc 208
Griffin Wheel Co 140

Halliburton Co 136
Hamilton-Kent Mfg. Co 57
Harley-Davidson Motor Co 8
Hayward Company 222
Hercules Powder Co 81
Hersey-Sparling Meter Co 160
Holiday Shores Motel 235
Homelite Corp 178, 179
Hough Company, Frank G 203
Huber-Warco Co 253
Hydrauger Corp., Ltd 224

Igloo Corp 204
Indiana Gunite & Construction Co., Inc 235
Industrial Shredder & Cutter Co 141
International Harvester Co 14, 15, 138
Iowa Valve Co 250

Jaeger Machine Co 234
Jefferson Hotel 226
Johns-Manville 158, 194
Joslyn Mfg. & Supply Co 34

Ka-Mo Tools Dept., Kwik-Mix Co 193
Kennedy Valve Mfg. Co 200
Kern Instruments, Inc 183
Kerrigan Iron Works Co 142
Klett Mfg. Co 224
Kohler Company 72
Komline-Sanderson Engineering Corp 76
Kwik Mix Co 193

Lathem Time Recorder Co., Inc 218
Layne & Bowler, Inc 33
Lindsay Co., Inc., P. K 220
Lock Joint Pipe Co 54
Locke Steel Chain, Lawn Mower Div 157
Lockwood Graders 202
Lord & Burnham 230

M & H Valve & Fittings Co 61
Mack Trucks, Inc 78, 79
Magee-Hale Park-O-Meter Co 128
Majestic Co., Inc., The B. P 77
Marbon Chemical Co 144
Massey Ferguson, Inc 68, 69
Meyer Machine, Inc 141
Minnesota Mining & Mfg. Co 30, 31
Minit Park Garage 208
Miro-Flex Co., Inc 198
Mitts & Merrill 189
Moline Malleable Iron Co 154
Moore, Inc., P. O 231
Morrow & Co., Inc., Wm 207
Morse Boulger, Inc 155
Motorola Communications & Electronics, Inc 53
Mueller Company 2, 117

National Chemsearch Corp 26
National Clay Pipe Mfrs., Inc 43
National Cylinder Gas 217
National Plastic Products Co 216
National Power Rodding Corp 204
Nationwide Traffic Engineering Products Corp 145
Neptune Meter Co 84
Newark Brush Co 62, 224
Northern Gravel Co 226
Norwich Wire Works, Inc 235

O'Brien Mfg. Co 37
Onan Div., Studebaker-Packard Corp 40, 41
Opelika Foundry Co 231

Palmer Filter Equipment Co 222
Parsons Company 192
Pettibone-Mulliken Corp 181
Plymouth Motors Corp 65
Price Brothers 150

Radiator Specialty Co 208
Radiant Lamp Co 147
Radio Corporation of America 132, 133
Recordak Corp 237
Revere Electric Mfg. Co 134
Reynolds Metals Co 137
Rockwell Mfg. Co 73
Rosco Mfg. Co., Rolcor Div 227
Rolatape, Inc 238
Ruemelin Mfg. Co 168
Rynal Corporation 145

Seeburg Corp 60
Seiscor Voting Machine Co., Div. Seismograph Service Corp 182
Shawnee Dept., Parsons Co 192
Sherman Products 59
Simplicity Mfg. Co 215
Smith & Co., Inc., Gordon 214
Standard Steel Products Mfg. Co 219
Steel Plate Fabricators Assoc 223
Steirt & Son, Inc., A 195
Swenson Spreader & Mfg. Co 209
Sylvania Electric Products, Inc 130
Syntron Company 168

Tarrant Mfg. Co 155, 207
Tennant Co., G. H 212
Todd Shipyards Corp 228

Unimasco, Inc 137
Union Metal Mfg. Co 126

Vapor Blast Mfg. Co 155
Vermeer Mfg. Co 231
Vibro Plus Products, Inc 162
Volkswagen of America, Inc 12, 13

Wallace & Tiernan Inc 163
Waukesha Motor Co 172
Wayne Mfg. Co 19
Wedge-Lock Clay Pipe Assoc 66
West Side Iron Works, Inc 213
White Diesel Engine Div 42
Whiting Co., E. B. & A. C 58
Wide-Lite Mfg. Co 123
Wilco Machine Works, Inc 232
Wild Heerbrugg Instruments, Inc 143
Wiley & Sons, John 204
Wood Co., John 233
Wood Brothers Mfg. Co 218
Wood Co., R. D 206
Woodward Iron Co 80

Young Spring & Wire Corp., L. A. Equipment Div 176

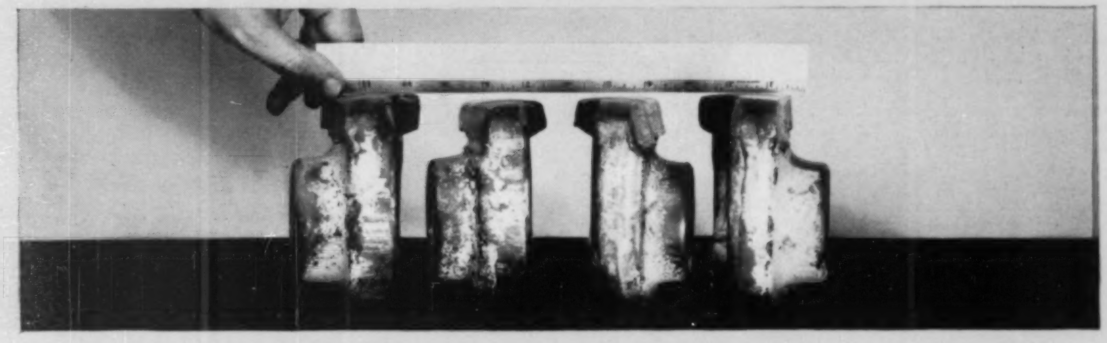
Zep Mfg. Corp 28

Special Report to Users of Caterpillar Equipment:

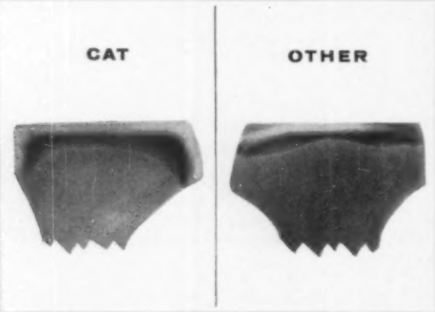
CAT CATERPILLAR

WHAT YOU DON'T SEE CAN HURT YOU

You can buy a lot of parts that *look* like genuine Caterpillar parts. Some may be cheaper initially. But they are as different as night and day when you get them in service.



Take these links, for example. They all *looked* identical when new. But see what has happened after 2000 hours on the same D8 Tractor! The two links in the center, a popular brand with induction-hardened rails, cost about 9% less than Caterpillar links originally, but showed about *50%* more wear.



The extra service you can expect from the Cat links can be seen and compared with other brands. Here are actual photos of etched cross sections of *production* links made by Caterpillar and the other manufacturer. The light areas at top show case depth and pattern of wear-resistant rail material resulting from heat treatment. See the deep, uniform wear case on top *and sides* of the Cat part? It's as hard as a good ball-peen hammer head. But in the other brand, the wear case varies both in depth and hardness . . . that's the reason why after 2000 hours on a D8 the Cat-made links had worn 50% less.

Investigate and you will find superiorities for every undercarriage component built by Caterpillar. This extra quality—though it sometimes costs a little more initially—pays off by delivering *extra* trouble-free working hours. That's why genuine Caterpillar parts cost you less per hour than other brands.

And when it's time to replace or rebuild your tractor undercarriage, see your Caterpillar Dealer. He is an undercarriage specialist with modern facilities to back him up. Get the full story on his many money-saving options and recommendations *tailored to your job conditions.* Truly CUSTOM TRACK SERVICE, designed to save you money . . . and offered only by your Caterpillar Dealer.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

CATERPILLAR

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Better rolling with less maintenance

For years a major problem confronting owners of rollers has been road "scuff" caused by looseness in the guide roll assembly. Huber-Warco engineers have solved this problem by making it easy to adjust all elements of the guide roll right on the job. Owners of Huber-Warco tandem and 3-wheel rollers will find a yoke design that permits accurate adjustment of tapered roller bearings at the kingpin, yoke swivel pin and roll axle. As a further precaution against looseness, we have set the bearings on the swivel pin and kingpin wider apart as well as designing a steering arm that is splined — not keyed — to the top of the kingpin, spreading the shearing load around the entire circumference of the pin. Extra long life of the assembly is further assured since all points of movement receive full pressure lubrication. With Huber-Warco design you are assured indefinite factory-perfect guide roll assembly adjustment. See your local Huber-Warco distributor for all the details on the tandem and 3-wheel rollers soon.

HUBER-WARCO COMPANY • MARION, OHIO, U.S.A.

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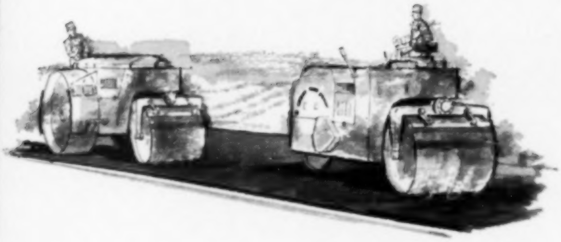
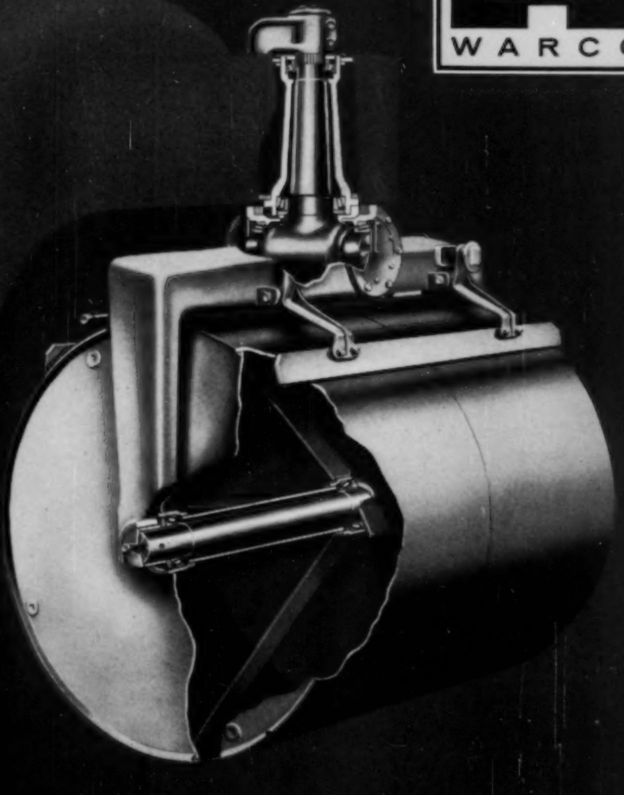
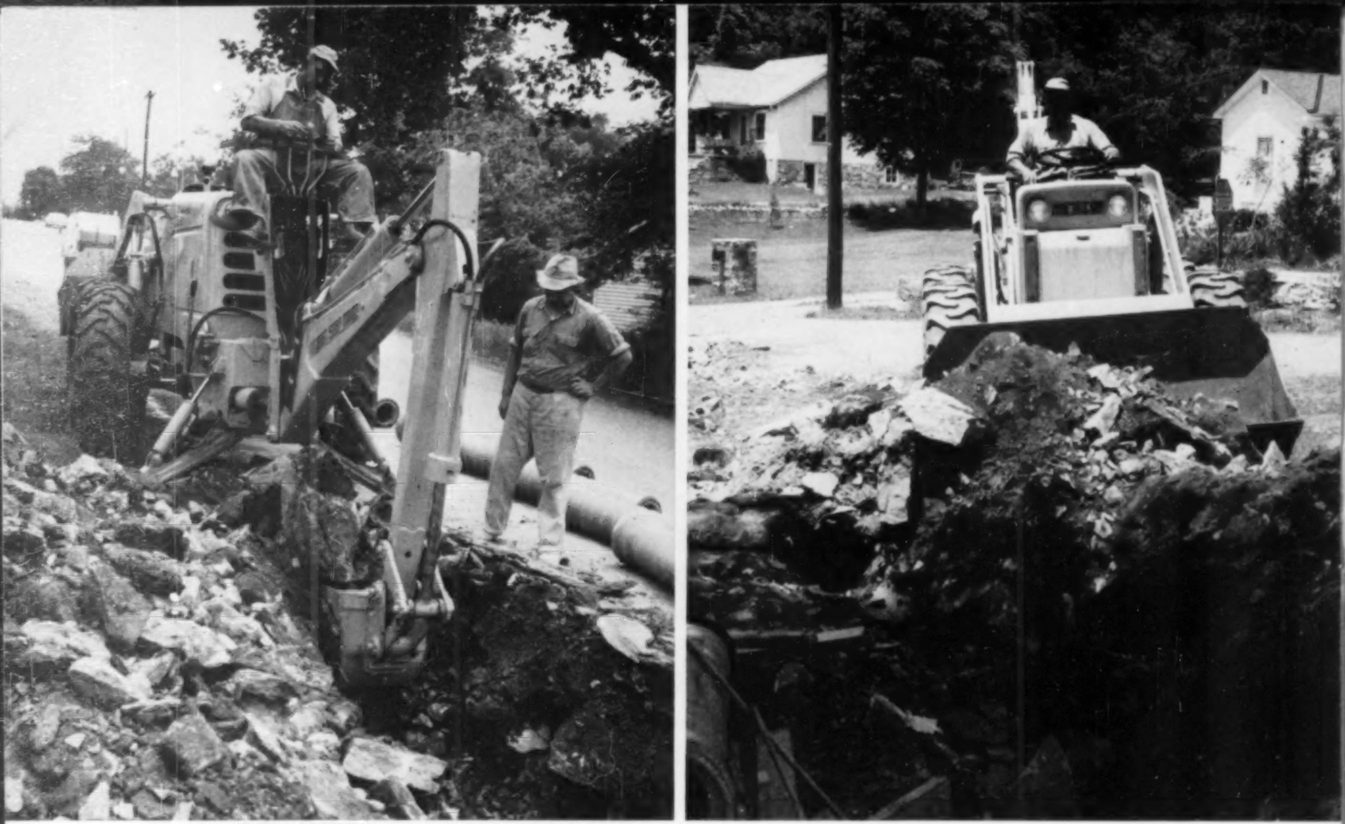




BUILT FOR PROFIT



Digs rock...lays pipe...backfills

In 25 hours, Michigan handles entire 650 ft sewer job for City of Columbia

"In the two seasons we've owned our Michigan Model 55A Tractor Shovel, we've used it economically—and successfully—on just about every maintenance-type job you can imagine," reports Public Works Director Morris Thurman, Columbia, Tennessee. "It's dug ditches and pipe lines... truck-loaded dirt, gravel, asphalt and other bulk materials . . . ripped old paving . . . spread bituminous material for street repair . . . graded and leveled."

An example of one of the Michigan's more dramatic assignments was the recent laying of a 10-inch sewer line *in 90% rock*. Equipped with a Michigan Snap-Mount Backhoe, the 66 hp Tractor Shovel *did the entire job by itself*.

First the Michigan used its 1 yd tractor shovel excavating bucket to scrape away surface material so the rock ledge could be drilled and shot. Next came trench excavation, the Michigan backhoe digging out both shot rock and adjacent hard-packed clay. Then, using the hoe's 180° swing boom, the Tractor Shovel assisted workmen in hoisting and laying the concrete pipe. Next came backfilling and soon, with the machine's big tires rolling over the loose material, the desired compaction. In all, only 25 work hours had elapsed—yet the 650 ft long, 5 ft deep line was completed.

"Backhoe on or off in a minute"

"One of the best features of the Michigan is this versatility," says Mr. Thurman. "We also like its mobility . . . plus the fact that one man can attach or detach the backhoe *in less than a minute . . . without tools*. This permits the Michigan to work on other jobs right up to the minute we need the backhoe. For example, it truckloads stockpiled asphalt, a one yard bucketfull every 20 seconds." And, with power steer, hydraulic brakes, horn, lights, parking brake, torque converter and power shift transmission (standard equipment on all Michigans), this Tractor Shovel has proved easy and safe to operate everywhere.

Investigate the 26 mph, 1 yd Model 55A for yourself. It's designed especially for city work—and city budgets. It has good digging power and a wide variety of attachments. Your Michigan Distributor will be glad to demonstrate one on your job—or to show you any of the larger Michigan Tractor Shovels (buckets up to 12 cubic yards).

Michigan Snap-Mount Backhoe

Can be attached (or detached) by one man in 30 seconds . . . without tools. Digs 12'4" deep, 12" to 36" wide. Can be combined with wide variety of quickly-interchangeable front-end attachments: sprinkler-type pick-up sweeper; crane hook; fork lift; scarifier; blower, "V", straight snow plows; broad range of buckets.

Michigan is a registered trademark of

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Construction Machinery Division

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